

Independent Forest Audit

Sudbury Forest

2001-2006



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1.0 Executive Summary

This report, for the Sudbury Forest, documents the results of an Independent Forest Audit (IFA) conducted by KBM Forestry Consultants Inc. under contract to the Ontario Ministry of Natural Resources (MNR). All Crown forests in Ontario are required to be audited at least every five years; the requirement for independent audits arising from MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario (2003). Regulation 160/04 of the Crown Forest Sustainability Act (CFSA) sets out the specific requirements for conducting the audits.

The Sudbury Forest audit covers the five-year period April 1, 2001 to March 31, 2006 and addresses the following:

- implementation of the last four years of the 2000-2005 Sudbury Forest Forest Management Plan (FMP) from April 1, 2001 through March 31, 2005;
- planning and approval of the 2005-2010 Sudbury Forest FMP; and,
- implementation of the first year (April 1, 2005 to March 31, 2006) of the 2005-2010 Sudbury Forest FMP.

Vermilion Forest Management Company Ltd. (VFM), and MNR Sudbury District are the principal auditees. VFM was granted the Sustainable Forest Licence (SFL) for the Sudbury Forest through Order-in-Council No. 1426/98 dated June 10, 1998 and administers the Forest from its offices in Sudbury, Ontario. The Forest has undergone a number of landbase changes since VFM was granted its SFL.

The Sudbury Forest is approximately 1.1 million ha in size surrounding the city of Sudbury, Ontario. It straddles the Boreal forest region to the north and the Great Lakes-St. Lawrence forest region (mixed-wood forests and agricultural areas) to the south with a large transition between. Tree species composition reflects the Forest's geographic situation with five types making up 81% of the Forest (white birch at 21%; jack pine at 18%; poplar at 17%; white pine at 14%; and black spruce at 12%). Sixteen other types are shown to comprise the remaining 19% of the Forest's composition.

The purpose of the IFA is to:

- Assess compliance with the Forest Management Planning Manual (FMPM) and the CFSA;
- Assess compliance of forest activities with the FMPM and the CFSA;
- Compare planned versus actual forest management activities;
- Assess the effectiveness of forest management activities in achieving audit criteria and management objectives;
- Assess the effectiveness of any action plans resulting from previous audits; and,
- Assess a licensee's compliance with the terms and conditions of the SFL.

Based on the audit, 20 recommendations were made. Recommendations can arise from audit team observations of material non-conformances, or may be developed to address situations in which the audit team identifies a significant lack of effectiveness in forest management activities.

Recommendations herein are directed to VFM and MNR under the following guiding principles of the IFA process:

- Public Participation – two recommendations
- Forest Management Planning – seven recommendations
- Plan Implementation – four recommendations
- Monitoring – six recommendations

Nine recommendations are directed to VFM, eight to MNR and three jointly to VFM and MNR. A further 12 suggestions are made – six to VFM, four to MNR and two to VFM and MNR together. Two best practices are also given – the first to VFM, MNR, and the Sudbury LCC and the second to VFM.

Two of the recommendations are more significant in nature. These recommendations address an aging FRI that was first developed from 1989 aerial photography; and, under-utilization of low-quality hardwoods which has

implications for achieving several forest management objectives, particularly for converting low-quality hardwood stands to white pine stands.

As the forest industry reels in the face of ever weakening markets, under utilization will continue to impact the capability of the SFL holder to meet the challenge of rehabilitating this forest to match the audit team's vision of its historic condition. Fire suppression will compound this problem.

The relationship between VFM and the MNR is exemplary. The parties engage cooperatively to overcome issues on the Sudbury Forest as was evidenced throughout this audit. Progress on the recommendations from the last IFA was also a cooperative effort, even when recommendations were focused solely on one of the parties. This cooperation manifests itself further in the collective approach to addressing the interests of First Nations in the area. VFM received FSC certification in 2005. The certification report describes VFM's commitment to First Nations as favourable on a number of fronts.

The audit team concluded that, with the exceptions noted in the audit report, management of the Sudbury Forest was in compliance with legislation, regulations and policies and was effective. The Sudbury Forest was managed in compliance with the terms of Sustainable Forest Licence No. 542442 held by VFM. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team also recommended that the Minister extend the term of the VFM Sustainable Forest Licence for the Sudbury Forest to March 31, 2028.



Peter Higgelke, R.P.F., M.Sc.F.
Lead Auditor, on behalf of the Audit Team

2.0 Introduction

This audit report presents the results of the Independent Forest Audit (IFA) conducted by KBM Forestry Consultants Inc. (KBM) on the Sudbury Forest for the five-year period from April 1, 2001 to March 31, 2006. The audit assesses the implementation of the last four years of the 2000-2005 Forest Management Plan (FMP) and the first year of the 2005-2010 FMP, including its planning process and approval. The Sudbury Forest is managed under a Sustainable Forest Licence (SFL) held by Vermilion Forest Management Company Ltd. (VFM). Throughout this audit report the audit team's reference to "the Company" also refers to VFM.

As the managers of the Sudbury Forest, the principal auditees are both VFM and the Sudbury District Office of the Ministry of Natural Resources (MNR). Other auditees include shareholders, contractors and other branches of MNR to the extent that forest management activities carried out by them are the subject of audit examination.

2.1 Audit Process

2.1.1 Purpose

The Independent Forest Audit Process and Protocol¹ (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. The IFAPP states that the purpose of an Independent Forest Audit is to:

- Assess compliance with the Forest Management Planning Manual (FMPM) and the Crown Forest Sustainability Act (CFSA);
- Assess compliance of forest activities with the FMPM and the CFSA;
- Compare planned versus actual forest management activities;
- Assess the effectiveness of forest management activities in meeting forest management objectives;
- Assess the effectiveness of any action plans resulting from previous audits; and,
- Assess a licensee's compliance with the terms and conditions of the Sustainable Forest Licence.

2.1.2 Audit Process Overview

The IFAPP contains 152 criteria and 403 procedures, 326 of which apply to the Sudbury Forest audit. The audit procedures serve as a framework to provide a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario.

The previous Independent Forest Audit (IFA) conducted on the Forest was undertaken in 2001². The implementation of recommendations contained in the previous audit was examined during the course of this audit (see Section 3.8).

The audit process for the Forest consisted of six components:

1. *Audit Plan*³: KBM prepared an audit plan that described the schedule of audit activities, audit team members and participants, and auditing methods. The audit plan was submitted to MNR, VFM, the Forestry Futures Committee (FFC), and the Chair of the Sudbury Local Citizens Committee (LCC).
2. *Public Survey*: KBM prepared a one-page public survey that was distributed to all organizations and to a random sample of one-third of the individuals listed in the FMP mailing list provided by MNR. It was also sent to all overlapping licensees, contractors, commitment holders and tourist operators. In addition, the public

¹ MNR. 2006. Independent Forest Audit Process and Protocol. Queens Printer, 26 pp. + Appendices.

² ArborVitae Environmental Services Ltd.. 2001. Sudbury Forest Independent Forest Audit 1996-2001, Final Report, 62 pp. + Appendices.

³ KBM Forestry Consultants Inc. 2006. Sudbury Forest Independent Forest Audit Audit Plan. 15 pp. + Appendices.

notice was posted on and available for download from KBM's web site (www.kbm.on.ca). The purpose of the survey was to solicit public input and to provide respondents with an opportunity to identify and discuss any site-specific concerns on the Forest. A copy of the survey is found in Appendix F.

Notices were placed in the: *Sudbury Star*, *North Bay Nugget* and *Wawatay* newspapers soliciting public input on forest management activities on the Forest for the period under audit. A copy of the public notification is found in Appendix G.

Twenty-one responses were received as a result of the public survey mail-out. A summary is presented in Appendix E.

3. *Field Site Selection:* The audit team carried out a preliminary site selection process prior to meeting with VFM and MNR staff. Annual Work Schedules (AWSs) and Annual Reports (ARs) were used to ascertain the amount and type of forest operations carried out on the Forest during the course of the audit term. A stratified random sample of sites was then selected to ensure that selected sites were representative of a cross section of all activities conducted on the Forest during the audit term. A pre-audit meeting was held in Sudbury on May 9, 2006. Much of the pre-audit was spent with VFM and MNR finalizing the preliminary site selection and developing an itinerary for the field portion of the audit.
4. *Pre-audit Document Review:* Prior to the eight-day site visit, the audit team reviewed documents provided by VFM and MNR, including the:
 - a) 2000-2005 and 2005-2010 Sudbury Forest FMPs;
 - b) Annual Work Schedules and Annual Reports associated with the above FMPs;
 - c) Conclusions of the 1995-2000 RPFO;
 - d) Year Ten Annual Report (2004-2005);
 - e) Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report;
 - f) 1996-2001 Independent Forest Audit Report for the Sudbury Forest;
 - g) Action Plan for the 2001 Independent Forest Audit of the Sudbury Forest; and,
 - h) Status Report on the Action Plan for the 2001 Independent Forest Audit for the Sudbury Forest.
5. *On-Site Audit:* The audit team spent eight days on site conducting the field portion of the audit (August 21 to 28). The audit team conducted interviews with staff from VFM and MNR. The audit team also conducted interviews with LCC members at both an evening meeting with the LCC and in some cases separately. In addition, interviews were conducted with representatives of First Nation communities. A closing audit meeting was held in Sudbury on August 28. This meeting provided a forum for the audit team to present and discuss preliminary audit findings with VFM, MNR, and the LCC.

The audit team examined documents, records, and maps at VFM and MNR offices, and spent two and one half days in the field examining forestry practices at 16 field sites. KBM committed to and achieved a sampling range of between 10 and 25% of key activities and operations conducted on the Forest.

Table 1 presents the sampling intensity of the field visits completed on the Forest. The objectives of the field site visits were to confirm that on-the-ground activities were conducted according to the FMPs, conformed to provincial laws, regulations, and guidelines, and were effective.

Table 1. Audit sampling intensity for the Sudbury Forest.

Activity	Total Area/Number (2001-2006)	Area/Number Sampled	Percent Sampled
Harvest (ha)	16,479	4,911	30
Renewal & Maintenance (ha)	23,651	6,096	26
Free-to-Grow (ha)	7,523	2,852	38
Area of Concern Categories* (#)	37	17	46
Roads Construction (km)	50	35	70
Road Maintenance (km)	200	60	30
Specified Procedures Review** (ha)	3,514	1,363	39

*Area of Concern (AOC) categories refer to the different types of AOCs present on the Sudbury Forest. Examples would include riparian reserves, cool water fisheries, osprey nests, etc. More than one AOC was associated with most sites selected for review of harvest and renewal operations. In addition, some sites were specifically selected to represent a cross-section of AOCs.

** The Specified Procedures Review involved the verification of maps, records, and fieldwork associated with Forest Renewal Trust Account expenditures for 2004-2005.

A sample of all key forest management activities was examined on the ground. Due to the large size of the Forest and access constraints, the audit team relied on a helicopter to reach a number of the field sites. Figure 1 presents the locations of the field sites.

6. *Final Report:* The audit results are presented in conjunction with a brief description of the audit process and the forest licence area under review. Within the report, an important distinction is made between recommendations and suggestions. Recommendations draw attention to deficiencies in management that require corrective action. In most cases, recommendations are a result of non-conformance to a law and/or policy, or specify a lack of effectiveness in forest management activities. Recommendations arising from this audit must be addressed in an action plan developed by VFM in consultation with the District Manager and designated Regional and Forest Management Branch representatives, as per Appendix E of the IFAPP. Suggestions are less serious in nature, and provide advice for improving particular aspects of forest management. The auditee is not required to address suggestions in the action plan, but is encouraged to do so. A best practice highlights an exceptional management practice or high level of performance noted on the Forest.

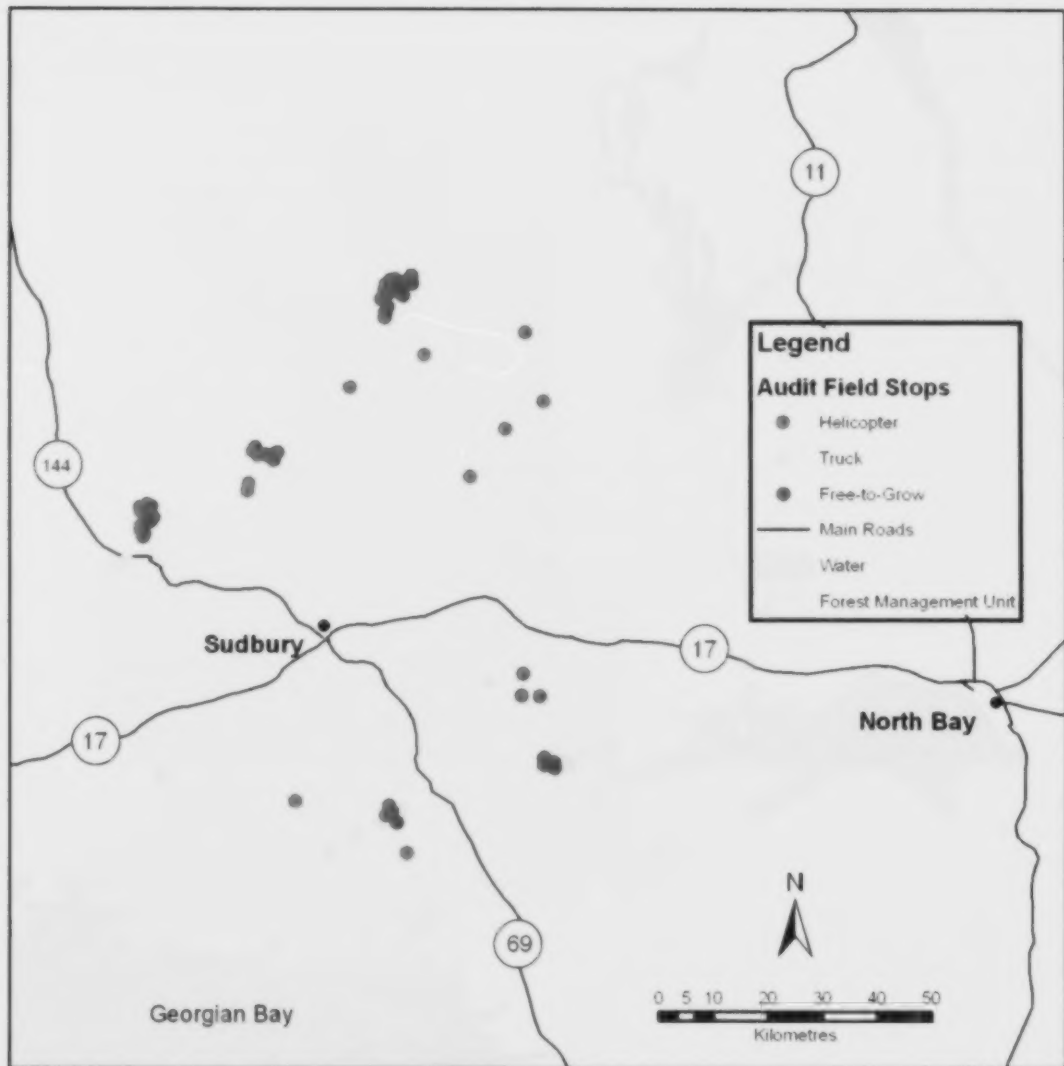


Figure 1. Audit field site locations.

2.1.3 The Audit Team

The audit was carried out by an independent audit team assembled by KBM Forestry Consultants Inc. under contract with MNR. The audit team consisted of six members:

- Peter Higgleke, R.P.F., Lead Auditor and First Nations Auditor
- Gabriele Aleksa, R.P.F., Silviculture Auditor
- Al Corlett, R.P.F., Harvest Operations Auditor
- Susan Jarvis, R.P.F., Forest Modelling (SFMM) Auditor
- John McNicol, Wildlife/Ecology Auditor
- Dave Thomson, R.P.F., Planning Auditor and Secretariat

Audit team members and their responsibilities are described in Appendix B.

2.1.4 Guiding Principles

The IFAPP identifies the components of the audit process. The audit protocol is the main body of the audit and consists of principles, criteria, and procedures. There are eight guiding principles within the audit protocol (Appendix C). Each principle contains a series of criteria that guide the audit team during its assessment of the achievement of the principles. Under each criterion a number of procedures serve to assess the auditee's compliance and effectiveness. KBM assigns each of the applicable procedures to an auditor, who in turn examines the evidence for conformity to the procedure. The eight guiding principles of IFAs are:

- Commitment
- Public Participation
- Forest Management Planning
- Plan Implementation
- Systems Support
- Monitoring
- Achievement of Management Objectives and Forest Sustainability
- Contractual Obligations.

2.2 Forest Management Context

2.2.1 Location of the Sudbury Forest

The Sudbury Forest is located in the MNR Northeast Region; primarily within the Sudbury District, with small sections in the North Bay and Timmins Districts (Figure 2). The Forest extends northward from Georgian Bay and the French River, to the boundary of Lady-Evelyn Smoothwater Provincial Park. It is bounded on the east by Lake Nipissing and on the west by the Town of Nairn Centre.

2.2.2 Sudbury Forest Overview

The following description of the Forest is based primarily on material included in the 2005-2010 Forest Management Plan for the Sudbury Forest:

The current Sudbury Forest originated through the combining of several separate management units (Killarney, Wanapitei, and Trout Lake). Vermilion Forest Management Company Ltd. administers the Sudbury Forest from its Sudbury office and distributes timber from the Forest to mills in Falconbridge, Chelmsford, Alban, Noelville, Hagar, Monetville, Sturgeon Falls, Nairn Centre and Espanola. Some hardwood species are shipped to mills in Englehart, Blind River, Mattawa and Huntsville. At the time of this report, the VFM was owned by the following six shareholders:

- H & R Chartrand Lumber Co. Ltd.
- Domtar Inc.
- Gervais Forest Products Ltd.
- Lahaie Lumber Ltd.
- N'Swakamok Forestry Corporation
- Grant Forest Products Inc.

The shareholders have changed considerably in the past two years. The 2005-2010 FMP lists ten shareholders, four of which remain on the above list.

The Sudbury Forest is administered by the MNR Sudbury District, and is managed by VFM under the terms and conditions of its Sustainable Forest Licence (SFL).

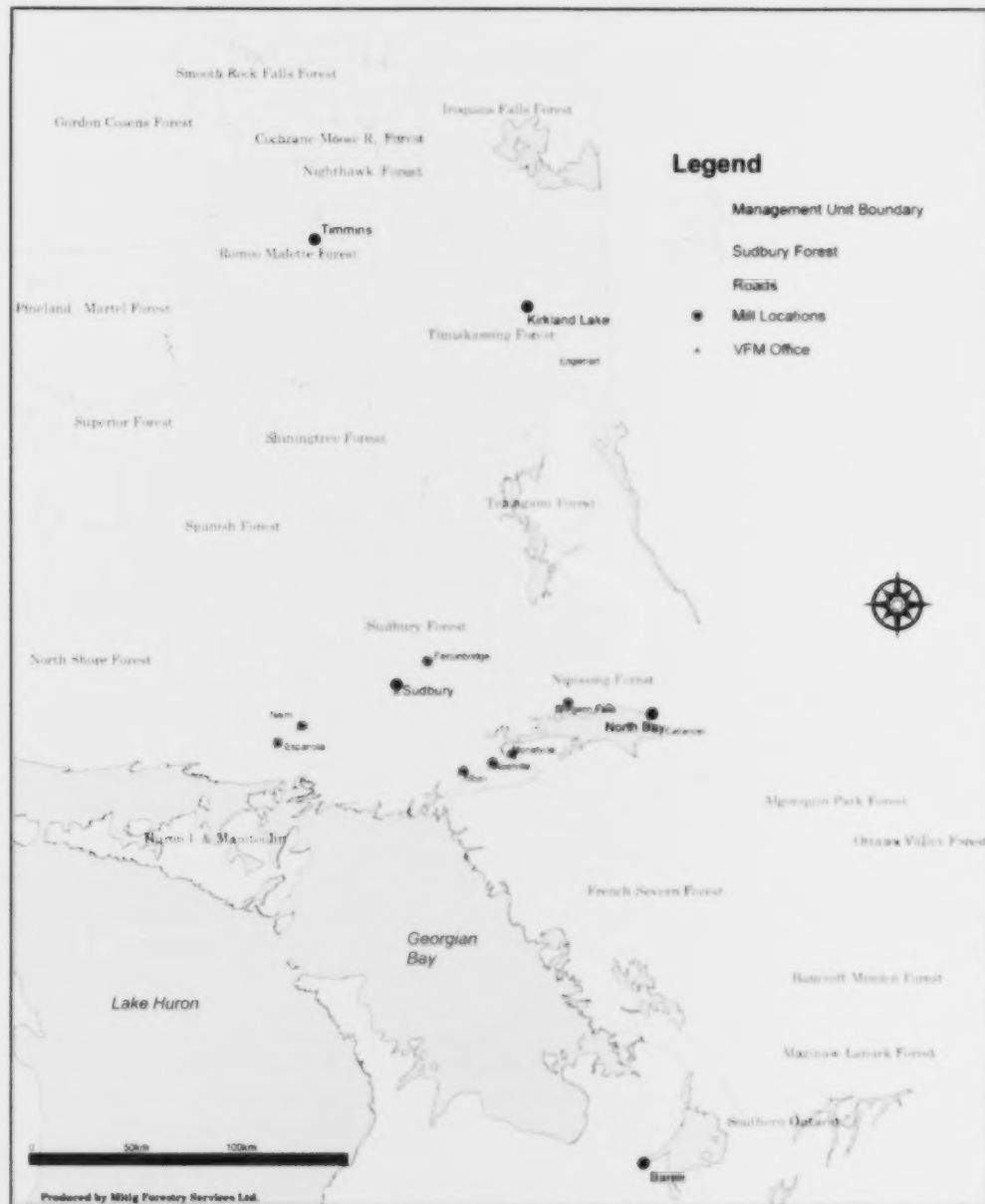


Figure 2. Location of the Sudbury Forest. Source: 2005-2010 FMP.

The Sudbury Forest straddles the Boreal Forest Region to the north and the Great Lakes-St. Lawrence Forest Region to the south, with a large area of transition forest between. The Forest comprises a total area of nearly 1.1 million ha (11,000 square km). Of this total area, approximately 447,855 ha are Crown-managed production forest (Figure 3). The northern portion of the Forest is predominated by jack pine, black spruce, white birch and poplar (Figure 4). The south and central portion contains a significant component of white and red pine (Figure 4). Small amounts of maple, yellow birch, white spruce, hemlock, cedar, larch, balsam fir, basswood, red oak, white ash, and black ash are also found on the Forest (Figure 4).

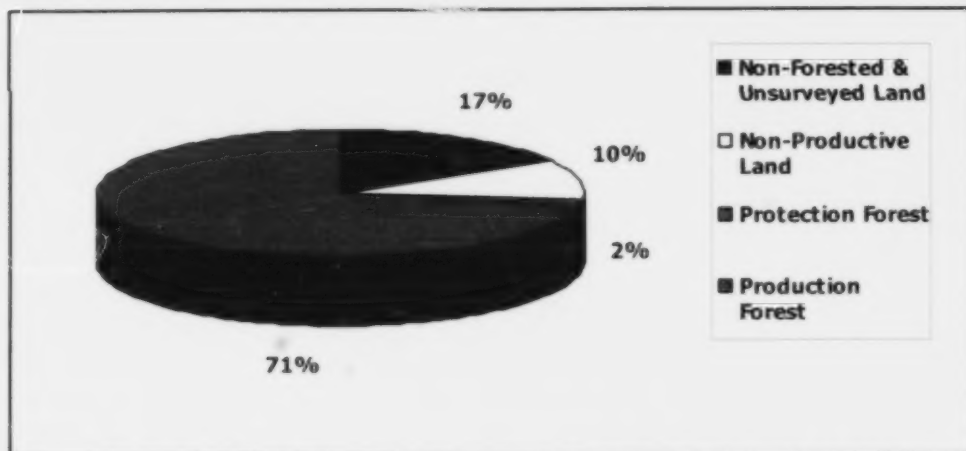


Figure 3. Summary of the Crown-managed portion of the Sudbury Forest by land type.
(Source: Table FMP-1, 2005-2010 FMP.)

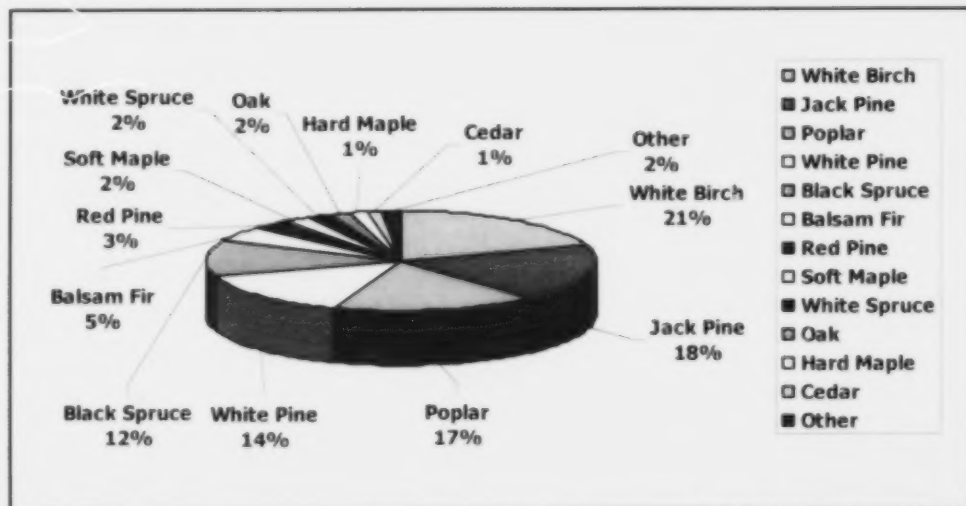


Figure 4. Working group summary of total productive forest area in the Sudbury Forest.
(Source: 2005-2010 FMP.)

2.2.3 Issues Impacting Forest Management

The IFAPP requires a review of high priority aspects (HPAs) of the auditees' systems or activities before the site visits take place. HPAs can include significant management challenges that are inherent to the Forest (e.g. presence of woodland caribou or extensive areas of sensitive soils), or can be specific issues that have arisen during forest management planning or plan implementation (e.g. conflicts with other forest users over proposed forest management activities).

The audit team requested that the auditees compile a list of HPAs for consideration during the audit. Following discussions with the auditees, four HPAs were identified and included in the Audit Plan. The audit team considered the HPAs during the conduct of the audit and a summary of findings is provided below. Additional discussion is also found in the audit report.

Low utilization

Utilization levels within cutover areas are acceptable, indicating improvement in relation to levels discussed in the previous audit. This improvement in part is due to the efforts of a Utilization Task Team which identified issues related to poor utilization and relevant approaches to dealing with them. The strategy and associated objectives and targets are included in Section 3.3.2.1 of the 2005-2010 FMP.

Utilization at the forest level however continues to be at a low level, with 61% of the forecasted volume and approximately 50% of the allocated area actually being harvested during the 2000-2005 planning period. This level of utilization appears to be long-term, is common to many forests across central Ontario, and will have implications to the attainment of several forest management objectives. Section 3.6.3 of this audit report deals with low utilization.

Access to Crown Land through private property - namely Inco's patent mining properties

The Sudbury Forest contains the Sudbury Basin, a part of the management unit in which mineral exploration and development have substantially altered the pre-settlement forest and land ownership. Parts of the Forest are accessible only through patent mining properties. Gaining permission to access these Crown lands has at times been difficult. The issue was recently resolved between VFM and Inco.

Final withdrawals from the Sudbury Forest of Ontario Living Legacy (OLL) areas

The Lands for Life and Living Legacy processes resulted in the creation of new parks and conservation reserves across Ontario. The conservation and forest reserves currently remain under the management of VFM; however, they are excluded from the allowable cut calculations. These reserves are afforded the protection until a final disposition is determined. The final land areas removed from timber production in the Sudbury Forest have yet to be calculated, but it is estimated that new protected areas will encompass about 5% of the Forest. The disentanglement process remains an issue for VFM due to the added uncertainties created for forest management planning.

Harvest allocation versus actual harvest of N'Skwakamok Forestry Corporation

The N'Skwakamok Forestry Corporation, a partnership of five First Nations bands, has harvest rights to 17.2% of the Sudbury Forest allocation. The corporation experienced several start-up related challenges during the period of this audit, particularly in terms of finding and retaining reliable contractors, and this led to an underutilization of its allocation. The allocation during the 2000-2005 FMP was approximately 241,646 m³, yet the actual harvest in 2001-2002 and 2002-2003 was 6,974 m³ and 11,057 m³ respectively. In 2003-2004 and 2004-2005 other shareholders were invited to assist N'Skwakamok in harvesting its allocation.

Positive steps have been taken by N'Skwakamok, VFM and the other shareholders to rectify this situation, including N'Skwakamok's efforts to attract and maintain a steady workforce, and the decision to (for the period of the current FMP) reduce its harvest to 8% from 17.2%, leaving the remaining volume available to other Overlapping Licensees. It is hoped that these steps will provide time for N'Skwakamok to build its capacity up to a level at which the corporation may manage its full 17.2% portion of the allocation.

3.0 Summary of Audit Findings

3.1 Commitment

An organization's policy acts as an important guide, providing a basis for making decisions in a consistent and reasoned manner. Policies help to ensure that decisions and actions undertaken by staff are related to the goals and objectives of the organization.

MNR and VFM have policy statements outlining their commitment to sustainable forest management. MNR's commitment is described in the Policy Framework for Sustainable Forests⁴ and the 2005 policy statement Our Sustainable Future⁵. VFM is certified to the Forest Stewardship Council (FSC) forest certification standard. VFM's policy statement outlining their commitment to FSC includes affirmation for:

- continuous improvement in the conservation of long-term forest health and productivity;
- responsible reforestation and protection of areas of special significance;
- forest land stewardship; and,
- stakeholder involvement.

Interviews conducted during the site visit indicated that staff members were aware of their respective organizations' policies and goals. Both VFM and MNR demonstrated a commitment to adhere to the rules and regulations governing forest management activities.

Goals and priorities that address the adherence to rules, regulations and statutes of Ontario are documented in Section 16 of the 2000-2005 FMP and in the 2005-2010 Five Year Compliance Strategy, and they are further detailed in each of VFM's subsequent Annual Compliance Plans. VFM has put considerable effort into training (whether during their Spring Operators Meetings or one-on-one "tail-gate" sessions) and their compliance monitoring program. MNR has conducted "checking" and compliance audits, monitoring and confirming VFM's findings. The compliance history for the Forest is discussed in more detail in Section 3.6.1.

3.2 Public Participation

3.2.1 Local Citizens Committee

As a requirement of forest management planning, a Local Citizens Committee (LCC) must be established to assist the plan author and planning team in preparation of the FMP and provide the MNR District Manager with advice when discretionary decisions are required.

The Sudbury LCC was formed prior to the development of the 2000-2005 FMP and was active during the development and implementation of the 2000-2005 FMP, and the 2005-2010 FMP. The LCC met all of the purposes outlined in the FMPM and effectively represented a balance of interests including First Nations and local interests (businesses, anglers and hunters, the tourism industry, naturalists, municipalities, loggers and cottagers). The LCC and the planning team did not hold joint meetings, but an LCC member served on the planning team, planning team members attended LCC meetings and LCC members participated in all task force meetings.

LCC meetings were open and effective and dissenting opinions were considered and recorded in the minutes. The LCC participated in the identification and analysis of management alternatives and recommended a late winter moose habitat option. The LCC was engaged in the identification of values on the Sudbury Forest and were successful in creating a Developed Lake AOC to protect the values of recreational cottagers. The LCC was also involved and highly effective in assisting the District Manager through an issue resolution process during the planning process. The LCC was active in monitoring the performance of plan implementation through the

⁴ MNR. 1994. Policy Framework for Sustainable Forests. 5 pp.

⁵ MNR. 2005. Our Sustainable Future. 21 pp.

categorization of amendments, the inspection of AWS submissions and through regular review of compliance reports.

3.2.2 FMP Standard Public Consultation Process

The 1996 FMPM⁶ describes the specific requirements of public participation during the preparation of FMPs. Stage Two of the public consultation process requires the issuing of the Notice of the First Information Centre, at least 30 days before its date and requires that the public notice for the First Information Centre will contain the following information: *"a statement that interested persons are asked to provide comments within 90 days of the issuance of this notice (for the assistance of the public, a specific date will be provided)"*.

Notices for the Sudbury Forest First Information Centre were distributed from November 3-5, 2003 and provided a deadline for comments of January 9, 2004. This allowed 61 days for comments, rather than the required 90. Subsequent notices provided the required comment period.

Recommendation 1: MNR must ensure that notices meet FMPM requirements.

Planning Team Minutes from May 7, 2004 report that public comments received via email with no "snail mail" address will not be included in the public correspondence. The notices sent to the public inviting comment to the planning process contained an e-mail address and did not mention a requirement for respondents to include a postal address.

Suggestion 1: MNR and VFM should ensure that all notices include appropriate instructions for response.

In addition to the required public consultation components from the 1996 FMPM, VFM, MNR and the Sudbury LCC employed a number of innovative tools to identify, notify and engage stakeholders and the public in the planning process. MNR researched and prepared an enhanced mailing list containing the names and addresses of 1,528 landowners adjacent to SFL lands. VFM placed a series of simple and concise ads in local newspapers inviting the public to attend Open Houses and comment on proposed roads, harvest areas and measures to protect values. VFM also advertised and conducted free field tours of the Sudbury Forest to provide an opportunity for interested members of the public to find out how the Forest is harvested and renewed and how forest ecosystems are protected.

Best Practice 1: VFM, MNR and the Sudbury LCC are commended for employing innovative tools and exemplary effort in engaging the public, stakeholders and interest groups in the planning process.

3.2.3 Native Peoples Consultation

The CFSA and the FMPM require opportunity for Native (Aboriginal under the 2004 FMPM⁷) input and involvement in the forest management planning process. Native communities have the option of participating in the regular public consultation process or choosing the additional consultation referred to as the Forest Management Native Consultation Program (FMNCP). Through this process, members of identified Indian Reserves, Band Councils, Treaty Organizations, or Tribal Councils are contacted by MNR regarding forest management planning in their area of interest. Public notices are posted in the Aboriginal media and in the Native language where required. MNR, with representatives of interested Aboriginal communities, also produce a Native Background Information Report that is used to prepare the Report on the Protection of Identified Native Values.

⁶ MNR. 1996. Forest Management Planning Manual for Ontario's Crown Forests. Queen's Printer for Ontario. 452 pp.

⁷ OMNR. 2004. Forest Management Planning Manual for Ontario's Crown Forests. Queen's Printer for Ontario. 440 pp.

Five First Nations are considered within or adjacent to the Sudbury Forest as follows: Dokis; Henvey Inlet; Wanapitei; Whitefish Lake; and Wikwemikong. Point Grondine Indian Reserve #3, a landbase of Wikwemikong, is also located within the Sudbury Forest. Temagami First Nation also has traditional land use areas in the Sudbury Forest.

Although First Nations participation and consultation was actively sought for the forest management planning process (evidenced in unofficial documents and interviews), MNR was unable to provide evidence of notices to all First Nations. Since these notices are required, the audit team makes the following recommendation.

Recommendation 2: MNR must retain records of all notices to all Aboriginal communities demonstrating that FMPM requirements were met.

It should be noted that participation by First Nations in activities related to forest management and forest management planning on the Sudbury Forest was exemplary. Efforts of VFM and the Sudbury District MNR were praised by First Nations representatives.

Vermilion Forest Management Company received Forest Stewardship Council (FSC) certification in the fall of 2005. The certification report⁸ describes VFM's efforts for First Nations as follows:

- *VFM has demonstrated substantial efforts in providing opportunities for long-term economic benefits for First Nations through their own forestry corporation.*
- *VFM is committed to including First Nations in forest management planning and operations.*
- *Memorandum of Agreement between VFM and the First Nation's N'Skwakamok Forestry Corporation outlines terms pertaining to the Protection of Native Values, harvesting rights, silviculture opportunities, planning and training opportunities and payment for use of traditional knowledge.*

3.2.4 Annual Work Schedules Public Inspection

The FMPM requirements for Annual Work Schedules (AWSs), aerial herbicide programs and prescribed burns were generally met. The 2005-2006 aerial herbicide program notice was missing the required map of the management unit containing sufficient detail of the location of treatment areas and did not contain the required statement in French indicating where information could be obtained in the French language.

Suggestion 2: VFM should ensure that all public notices meet the requirements of the FMPM.

3.3 Forest Management Planning

3.3.1 Planning Team Activities

The planning team for the 2005-2010 Sudbury Forest FMP was established and approved by the District Manager as required by the FMPM and the composition of the team was appropriate. A member the Sudbury LCC was an active and contributing member of the planning team. The planning team was chaired by a Registered Professional Forester. Regular reports of FMP progress were made to the Sudbury LCC by the Chair of the planning team. Planning team members attended all information centres.

Terms of Reference were developed and approved in a timely fashion and the roles and responsibilities of the planning team were clearly defined. Where additional expertise was required, the Terms of Reference indicated the names and responsibilities of individuals who would be involved.

⁸ Mark, W., P. Higgleke, M.R. Keyes and M.A. Seabrook. 2006. Forest Management and Stump-to-Forest Gate Chain-of-Custody Certification Evaluation Report for the: Sudbury Forest Under the Sustainable Forest License of the The Vermilion Forest Management Company Ltd. Certification Registration Number SCS-FM/COC-094N. Scientific Certification Systems, Emeryville, CA., 64 pp.

The planning team established timelines for activities and events in the planning process according to the requirements of the FMPM. The format and schedule for public consultation was outlined in the Terms of Reference and generally followed through the planning process. A deviation from the planned format occurred in 2004 when the planning team decided to hold a second draft plan review information centre.

Public correspondence during plan development was recorded and responses to requests for information and to queries were appropriate and timely, including meetings and presentations when necessary.

3.3.2 Resource Stewardship Agreements

During the planning process for the 2005-2010 FMP, VFM contacted 84 resource-based tourism businesses with an invitation to enter into Resource Stewardship Agreement (RSA) negotiations. VFM met with approximately 30 operators and RSAs were developed with 14 of them. The 2005-2010 FMP contained the required statement of commitment to maintain the viability of the tourism industry by protecting tourism values in the FMP process through the application of the Tourism Guidelines⁹ and the use of RSAs. The FMP also noted that the terms of any RSA do not bind or limit the Minister's right to make land use decisions for Crown land in Ontario.

3.3.3 Sources of Direction

Forest management planning relies upon numerous sources of direction, including provincial legislation, MNR policy and guidelines, legal commitments, regional strategic direction, and local land use and resource management plans. MNR is responsible for identifying the relevant sources of direction to ensure forest management planning teams are aware of, and have access to these items. All of the relevant sources of direction were used in the preparation of the FMP. Planning team members indicated in interviews that MNR Region ensured planning teams received relevant sources of direction and new information as it became available.

3.3.4 Introduction

The 1996 FMPM states that the introduction to an FMP must include a brief description of how MNR's Statement of Environmental Values (SEV) under the Environmental Bill of Rights (EBR), as amended from time to time, was considered in the development of the FMP, in the form of an SEV briefing note. The briefing note met requirements, was appended to the 2005-2010 FMP and referenced in the index of the environmental components of the FMP.

3.3.5 Management Unit Description

The management unit description included thorough and complete descriptions of the formation of land types, geology, soils and sites. It described how these factors determine tree species composition and the formation of forest units for management purposes. It also provided a description of how the Sudbury Forest is divided according to its various site regions, and site districts, and the assignment of ecosites to each forest stand which tie into the silvicultural objectives and strategies and the silvicultural ground rules.

The historic forest condition, describing the original forest types and natural processes such as fire and insect damage, was well done. The influence of past logging, mining practices, and human settlement on the Forest was also described. It provided an account of the effects of mining and the sulphur dioxide emissions from smelting operations on the Sudbury Basin Forest and the subsequent land reclamation program. Ontario Land Surveyor records were used to provide some information on what the Sudbury Forest was like before extensive human intervention. The FMP showed the relative proportion of each working group on the Sudbury Forest around the turn of the last century. These data were used to help develop objectives, targets and strategies to move toward a forest composition more similar to the one which occurred at that time.

⁹ MNR. 2001. Forest Management Branch, Management Guidelines for Forestry and Resource-based Tourism. Queen's Printer for Ontario, Toronto, ON. 24pp. + appendices.

The 1989 Forest Resource Inventory (FRI) was updated as required in the FMP manual to accurately describe the current forest cover, although the discussion of the reliability of the forecast was weak. The MNR did provide the inventory base feature data and FRI for non-licensed Crown and non-Crown areas by January 1, 2003, but the format in which the data was received had to be converted for use by the SFL. The need for data conversion relates to the fact that the MNR and the forest industry used (and to some extent still use) different formats to store proprietary information. Since this time, much effort has been directed towards developing standard exchange protocols and technical specifications for data exchange purposes. This challenge was common to most SFLs and MNR offices, and improvements have been noted.

The 2005-2010 FMP is based on the 1989 FRI that had been updated to the year 2005. This is the same FRI base that the 1995-2000 and the 2000-2005 FMPs were created with, and with additional updates to reflect depletions and Free-to-Grow (FTG) information, it will be used in the development of the ten-year 2010-2020 FMP. VFM staff indicated that the Forest will be re-inventoried in 2014-2015 and a new inventory will be available for preparation of the 2020-2030 FMP. However, towards the end of the 2010-2020 FMP, the current FRI base will be almost 30 years old.

VFM has recognized age-related weaknesses in the current FRI and has sought funding to update specific pieces of information, e.g. a white pine stage of management classification, a hemlock looper damage inventory, and a more accurate inventory of natural red pine stands. There are other aspects of the current FRI that if updated as well, would permit the development of a more robust 2010-2020 FMP, and they may include such things as understory development not apparent at the time of the original photo interpretation, or the condition of overmature stands for which harvesting has been delayed.

Recommendation 3: VFM, in collaboration with MNR, must develop a strategy to address the reliability of an aging FRI in support of the 2010-2020 FMP.

The 2005-2010 FMP includes a good description of the wildlife and fish species on the Forest and the habitats that support them. The FMP provides the current non-spatial habitat status of 22 wildlife species as well as a spatial analysis of habitat for moose, white-tailed deer and marten. The spatial analysis of habitat for moose, deer and marten was conducted to provide the planning team with an idea of where the current habitat for these provincially featured species was so that forest management activities could be modified in those locations if necessary. Similarly, more of the Sudbury Forest's coldwater and warm water fisheries were classified in this FMP as the result of thermocoding efforts carried out by MNR so that the proper AOC prescription could be applied.

The Sudbury Forest is home to a small herd of elk which, although augmented recently as part of the Provincial elk reintroduction program, has resided there for decades. The FMP also identifies ten rare, threatened and endangered species and where they might be found in this Forest including the red-shouldered hawk, the eastern Massasauga rattlesnake and the wood turtle. Objectives and strategies for the maintenance of these species on the Forest, including the preparation of AOC prescriptions for many of the species, were developed in the FMP.

One of the indicators of sustainability that is examined during the Strategic Forest Management Model (SFMM) modelling is wildlife habitat. It is an FMPM requirement that the selected management alternative cannot threaten wildlife habitat for selected species at the ecoregional scale. The audit team noted that seven wildlife species on the Sudbury Forest are projected to experience 30-36% habitat declines in seasonal or year round habitat under the selected management alternative once the desired future forest condition is reached. The audit team feels that ecoregional analysis of wildlife habitat status for the 22 regionally selected species is needed to provide context for the habitat conditions for these seven species on the Sudbury Forest.

Recommendation 4: Corporate MNR must ensure that when a selected management alternative causes significant loss of habitat for a species in the context of the forest management unit, that the habitat implications are examined for that species at the ecoregional scale.

Cultural heritage values were documented in the FMP primarily in Killarney and French River Parks although the cultural heritage site predictive model was run and other areas of high potential were identified throughout the Forest. VFM contracted a number of Stage 2 archaeological investigations of the high potential sites potentially impacted by forestry operations. The usual outcome of these investigations indicates that no archaeological discoveries were made.

MNR provided a complete socioeconomic profile for the Sudbury Forest based on 2001 Census data and the 2005-2010 FMP contained a detailed summary of the profile, including a discussion of the value being added to communities by forest operations.

During the conduct of the audit, the audit team encountered a 65 ha (160 acre) parcel of land within the Sudbury Forest that was categorized as Patent and excluded from the SFL. Further examination by MNR determined that this parcel had reverted to Crown 30 years ago, but was still recorded as Patent and was therefore not considered part of the SFL.

Suggestion 3: MNR should continue to review the Sudbury Forest landbase to reclassify Crown Patent land that has reverted back to Crown and add it to the SFL.

3.3.6 Objectives and Strategies/Management Alternatives

Objectives and targets were included in the 2005-2010 FMP to address forest diversity, social and economic matters, provision of forest cover and silviculture as required by the CFSA and the 1996 FMPM. The objectives adhere to principles expressed in provincial as well as local direction. Strategies were included to support objective achievement.

A comprehensive range of management alternatives was considered in the 2005-2010 FMP, including the three mandatory management alternatives required by the FMPM to determine the Forest's theoretical timber production potential. An additional alternative, later selected for implementation, was investigated that provided more balanced consideration for all objectives. All management alternatives were compared to a natural benchmark scenario that represented how the Forest was expected to develop over time in the absence of human intervention (i.e. no harvesting, no renewal treatments, no fire suppression).

The range of management alternatives identified in the FMP addressed FMPM requirements and satisfied the planning team and the LCC. The LCC requested an investigative scoping run *To enhance wildlife habitat, especially late winter moose and marten*. The 2005-2010 FMP contains objectives to increase late winter moose habitat and marten habitat which applies to all alternatives and was assessed for achievement for the selected management alternative. The LCC also asked for objectives to maintain natural red pine stands on the landscape, and to work on specific objectives around "old growth" forests. The objectives to address the LCC concerns included 3.3.1.3 Old Growth and 3.3.1.4 Conservation of Genetic Diversity for White Pine and Red Pine. The LCC requested that additional wildlife species be added to the selected species list, specifically the lynx, grey wolf and elk. These species were included in the FMP with appropriate habitat analysis.

A reasonable and comprehensive set of objectives and targets were determined for the FMP, varied for each management alternative and logically incorporated into the SFMM modelling. Strategies relevant to the management unit were stated for each objective.

The FMP management alternatives were analyzed through the use of SFMM with results documented in the FMP for all alternatives. Electronic SFMM files were provided to the audit team for inspection and verification. The FMP provided extremely good background information to the SFMM modelling inputs.

The SFMM modelling for the 2005-2010 FMP was well structured and inputs generally utilized the best available information at the time of FMP preparation. Some instances in the SFMM modelling were noted where

improvements could be suggested for the next FMP. These instances and associated suggestions are further explained in the following paragraphs.

The operability of small jack pine trees was identified in the 1995-2000 RPFO as an issue for the Sudbury Forest. In the strategic SFMM modelling for the 2005-2010 FMP, the lower operability age for the PJ1 forest unit for all intensities was set at 60 years, containing 80% sawlogs and 20% pulpwood. The 1995-2000 RPFO stated that some areas contained trees too small at 61-80 years to be economically harvested even for pulpwood, therefore bypass areas resulted. SFMM projects a majority of young Pj for harvest in 60-70 year age class. Therefore, the audit team suggests that there is a need to re-evaluate this issue for 2010-2020 FMP and potentially increase the lower operability age in SFMM to perhaps 70 years and potentially decrease sawlog proportion.

Maximum decreases and increases were specified in the strategic modelling for all forest units at +/- 10-20% (decrease/increase). This served to significantly stabilize the harvest areas through time in all management alternatives. Additional harvest areas and volumes could be realized if more flexibility was allowed in projected available harvest area by forest unit.

No biological renewal limits were included in the mandatory management alternatives. Many minimum and maximum renewal limits were included in the selected alternative to relate to management decisions. Limits are very prescriptive and limiting for certain forest units (i.e. BW1 and PO1 are forced to treat all harvest areas exactly 80% extensively and 20% intensively). Yet both forest units have basic treatments included in the Post-Renewal Forest Succession list of potential treatments and costs. The audit team suggests that minimum and maximum limits on renewal should reflect ecological site limitations in the mandatory alternatives (and base model for 2010-2020 FMP) and can be expanded to include additional management decisions in the selected alternative (called Proposed Management Strategy in 2010-2020 FMP).

Suggestions directed at the 2010-2020 FMP strategic modelling are summarized in one suggestion below:

Suggestion 4: VFM should, for the preparation of the 2010-2020 FMP:

- a) Review and revise operability age assumptions to consider minimum merchantable piece size by product for jack pine.**
- b) Revise harvest area stability constraints to allow flexibility in projected harvest areas which may enhance socio-economic benefits from the Forest.**
- c) Revise forest renewal limits by proportion for the base model to reflect biological/ecologically based limitations. Limits should be expanded in the Proposed Management Strategy to include additional management decisions if warranted.**

The FMP provided an excellent discussion of the assessment of forest sustainability and objective achievement for all management alternatives. Management Alternatives 1, 2, 3 and 4 (SMA) all passed the test of forest sustainability and achieved objective targets to varying degrees. Overall MA4 ranked highest when all objective targets were assessed through the short-term and long-term, and after consideration of socio-economic analysis. The FMP text included clear rationale in support of the choice of the selected management alternative for implementation in the FMP. The analysis of management alternatives was very accurately documented in FMP text, tables and appendices. The documented available harvest area by forest unit was consistent with the outputs from the SFMM modelling and was accurately documented in the FMP text and tables.

The required examination of the results and analysis of the socio-economic impact model (SEIM) was completed by the planning team and the LCC.

Eligibility criteria for harvest, renewal, and tending were clearly stated in the FMP and were consistently applied in the strategic modelling. The audit team noted that there was no reference to natural disturbances as being

eligible for forest management activities. While minor in magnitude, the inclusion of natural disturbances being eligible for salvage harvesting or subsequent renewal activities should be considered for the next FMP.

Suggestion 5: VFM should include natural disturbances as being eligible for harvest, renewal and tending activities during preparation of the 2010-2020 FMP.

3.3.7 Operational Planning

AOC Planning

Within areas selected for forest management operations, identified values are afforded protection through the implementation of prescriptions that are applied to defined geographic areas surrounding or adjacent to the identified value. These areas and their associated prescriptions are called Areas of Concern (AOCs).

AOC planning begins with the timely identification of values (e.g. heron nest sites, canoe routes, native burial site, etc.) in areas proposed for forest management. The collection of values information is MNR's responsibility. New values are entered into the Natural Resource Values Information System (NRVIS), which MNR maintains. A values map is produced from this data base which is used to ensure that forest management activities are planned in a way to ensure potential adverse impacts to values are minimized where values are located in the vicinity of planned operations.

The 2001 IFA reported that some wildlife values information on the Sudbury Forest was in need of updating. As an example, it stated that most of the Moose Aquatic Feeding Area (MAFA) values information had not been updated since the 1990s. Sudbury District acquired funding during the implementation of the 2000-2005 FMP and updated the MAFA's in areas proposed for operations in the 2005-2010 FMP. While flying waterways during MAFA surveys, great blue heron and osprey nest sites were also identified and updated.

Other wildlife values inventory work included:

- A 2003-2004 aerial inventory of moose late wintering habitat; and
- A survey for the endangered wood turtle conducted in 2003-2004 which resulted in waterways identified as wood turtle habitat.

The proper classification of water bodies into warm water or cold water categories (thermocoding) was also conducted in areas of proposed operations to enable planners to develop the proper prescriptions for water quality and fisheries habitat protection.

The collection of information on Native values to ensure their protection during forest management operations is a challenge for many MNR districts. Sudbury District provided funding to three First Nations (Wanapitei, Wikwemikong and Dokis) to hire their own consultant to collect this information and the process was very successful. Wahnipitae and Dokis First Nations supplied their values information in digital format while Whitefish River and Wikwemikong First Nations supplied values information on maps. Whitefish Lake First Nations chose not to provide information.

Many of the operations on the Sudbury Forest are shelterwood and selection systems which require tree marking. Tree markers often discover small raptor stick nests and cavity trees that they mark for retention and the audit team saw evidence of nest trees and cavity trees marked in this manner (Figure 5).



Figure 5. Broad-winged hawk nest on the Sudbury Forest.

The 2001 IFA recommended that the 2005-2010 FMP include "a strategy and objectives for fish and wildlife surveys". The audit team saw strategies and objectives for inventories conducted to prepare for the 2005-2010 FMP but nothing to address surveys necessary for preparation of the next FMP. The collection of values information is an ongoing process and surveys in areas proposed for operations in the next FMP should be initiated years before it is due. MNR should also look at updating information on non-industrial uses of the Forest for commercial (e.g. tourism, trapping) and recreational and other non-commercial uses showing number of visitors, users, travel distance, etc. for the management unit. These data were identified as missing for the development of the 2005-2010 FMP.

Recommendation 5: MNR must ensure that adequate resources are made available for the collection of values information, including socio-economic data on commercial (e.g. trappers, tourist outfitters, etc.) and non-commercial users of the Forest, in preparation for the next FMP.

Once new values are identified they must be entered into NRVIS to ensure that MNR values maps are up-to-date for planning purposes. The audit team checked a number of new and amended values identified by MNR (MAFAs, moose late winter habitat), VFM staff (nest sites) and the public (Trout Lake campers) and determined all the values were properly recorded in the electronic data base.

Where values were identified which could be adversely affected by forest management activities, specific prescriptions were applied within AOCs. Since the Sudbury Forest is in the transition zone from Great Lakes - St. Lawrence forest types in the south to boreal conditions in the north, different prescriptions were applied for the same value depending on the forest type in which a value was found (e.g. heronries). In other cases such as MAFAs, the Great Lakes - St. Lawrence prescription was used (30 m reserve plus 90 m modified) but strip clearcutting was allowed in the modified portion of the prescription if the MAFA was adjacent to a clearcut (usually found in boreal forest conditions).

Where the appropriate guideline provided specific direction (e.g. 90 m reserve adjacent to fish spawning sites), that direction was provided in the prescription. Where specific direction for protection of a value was not included in a guideline, and there were many examples of this in the FMP (e.g. shoreline buffers to protect aesthetic concerns on waterways used by tourist outfitters, protection for cottages, cultural heritage trails, etc.), different prescriptions were developed to meet site conditions and (where relevant) stakeholder concerns specific to that value (e.g. the prescription for developed cottage lakes). Tertiary road restrictions in prescriptions were common, especially for areas covered by an RSA (e.g. the Wanapitei RSA). No prescriptions to protect non-timber values were listed as exceptions to a guideline.

The Sudbury Forest has a large number of RSAs and the audit team expected to see a number of alternatives presented in supplementary documentation to deal with a particular value (e.g. aesthetics along creek systems used by guests of tourist establishments). Instead, one detailed prescription was presented that reflected different conditions which could be encountered. These negotiated prescriptions captured the concerns of the outfitters and thus provided the rationale given for not considering alternatives. The audit team found this an acceptable approach. In other situations where no specific direction was provided for the protection of a value (e.g. snowmobile trails, unauthorized trails used by the public, portages, etc.) supplementary documentation considered alternatives to the proposed prescription as required.

Silviculture

The Silviculture Ground Rules (SGRs) describe the current and future forest condition, ecosite type, silvicultural treatment package (STP) and regeneration standards. The silvicultural treatment package includes a silvicultural system, with a range of acceptable harvest, site preparation, regeneration, and tending methods. The STP believed to be the most efficient and effective in achieving the standards specified in the SGR for a given forest unit and site type is prescribed. Within the SGRs, the preferred STP is identified and the remaining STPs for that SGR are ranked in order based on expected frequency of use.

On the field audit the auditors observed red spruce which was planted as part of a plantation containing red pine, white pine, and white spruce. This species was not included in the original silvicultural ground rules, nor was the AWS amended to include it. While the proper process was not engaged for red spruce planting on the Sudbury Forest, the audit team finds the practice worthy of continuing since the species was once more common in the area.

Recommendation 6: VFM must amend SGRs to include red spruce as a species option.

An exception to A Silvicultural Guide for the Great Lakes-St. Lawrence Conifer Forest in Ontario¹⁰ and A Silvicultural Guide for the Tolerant Hardwood Forest in Ontario¹¹ were included in Table FMP-10. The exception permits full-tree logging in the prep cut and seed cut stages of partial harvest systems for several forest units. The full-tree logging method in partial harvest silviculture systems is considered "Not Recommended" in the above noted silvicultural guides citing the high risk of damaging residual trees and advanced regeneration.

To meet monitoring requirements associated with an exception to the silvicultural guides, a detailed monitoring strategy was developed. At the time of this audit, the exception had not been used on the Sudbury Forest.

¹⁰ MNR. 1998. A Silvicultural Guide for the Great Lakes-St. Lawrence Conifer Forest in Ontario. 424p.

¹¹ MNR. 1998. A Silvicultural Guide for the Tolerant Hardwood Forest in Ontario. 500p.

The planned renewal and tending activities for the 2005-2010 term are summarized in Table FMP-25 of the 2005-2010 FMP. The forecasts identified here are a combination of:

- Renewal and tending levels associated with the selected management alternative SFMM;
- Planned harvest level for the five-year term;
- Existing depletions requiring renewal and tending; and,
- Revenue expected to be available from the Forest Renewal Trust Fund.

Renewal and tending activities on the Sudbury Forest follow the harvest by one year for planting and possibly several years for tending. As a result, the area described in Table FMP-25 showed some area that was harvested in the 2000-2005 term (about 25%) and about 75% of the area being treated is harvested in the 2005-2010 term. Areas that were depleted in the previous FMP will be renewed using the SGRs of the 2005-2010 FMP. Many of the silviculture strategies of the 2000-2005 FMP are continued in the 2005-2010 FMP.

The total area planned for regeneration is 32,588 ha. The total planned harvest area is 33,363 ha. The difference can be accounted for by losses due to roads and landings.

The forecast for tending was 17,640 ha. This includes aerial chemical tending, ground mechanical chemical tending, ground manual chemical tending, pre-commercial thinning and improvement cutting which would achieve management objectives for the 2005-2010 FMP.

The necessary renewal support requirements for planned operations were documented in the 2005-2010 FMP. This included information on seed inventory, expected use and collection requirements for the five-year period. Also, a forecast of quantities of planting stock needed, and a forecast of the quantities of tree seed to be collected was included.

Roads

The development of access through the primary and secondary road construction proposed in the FMP was consistent with FMP objectives and development of the unit over time. Five primary road corridors were considered during the development of the 2005-2010 FMP covering proposed access development until 2025. No remote Native communities were affected by the proposed access development.

Demands on the Sudbury Forest for uses other than forestry are high. The City of Greater Sudbury is located in the centre of the Forest while other population centres are located in and around the Forest. VFM's access planning on the Forest is difficult because of user conflicts (e.g. resource-based tourism versus casual recreational users), access restrictions from other planning exercises (e.g. Temagami Comprehensive Land Use Plan, Sudbury District Land Use Plan, Ontario Living Legacy Land Use Strategies), and the large number of users. Similar concerns were documented in the 2001 IFA.

Compounding the problem is the lack of a comprehensive access strategy developed by MNR for Crown lands in and around Sudbury District. VFM is left to develop access on SFL Crown land without knowledge of what MNR's plans are for road systems in areas adjacent to and within the SFL. Because of liability concerns, MNR is being forced to examine existing road networks no longer being maintained by industry or MNR and determine whether they should be maintained or physically decommissioned. This is a defacto access strategy that impacts land use management and should be developed in a publicly vetted exercise.

Suggestion 6: MNR should address strategic roads planning at scales above the SFL level in the Sudbury area to alleviate recurring conflicts on road use strategies.

The 2001 IFA found tertiary roads being used for longer time periods and built to higher standards than appropriate. Many of these roads were being used as secondary roads for forest management purposes and also for recreational purposes by the general public. A recommendation from the 2001 IFA stated that the access

strategy developed in the 2005-2010 FMP should include full consideration of existing tertiary roads and the roles they are playing in the Sudbury Forest. In response, the 2005-2010 FMP contained planning for all roads required to reach operating blocks, including tertiary roads. Many of the primary and secondary roads were in-part proposed incorporating existing tertiary roads that had been used beyond their normal term. This strategy had the dual benefit of using an existing road bed (and attendant water crossings) while incorporating the existing bed into a properly classified road. The existing tertiary portion of the new proposed primary or secondary road used a 500 m corridor (250 m on either side) within which to assess alternatives. Usually the existing road bed was the preferred alternative since water crossings had already been installed and the road was in the most logical location.

If new tertiary roads were required to reach an operating block, a 500 m corridor was shown on the operations map, and AOC planning was done for the corridor. All new tertiary roads were planned to be built to minimum standards with the intent that VFM would remove all water crossings once they have finished with the road before transferring responsibility to MNR. MNR could provide alternative direction if, for example, a third party had agreed to assume responsibility for the road.

Road use strategies developed in one FMP for a particular road can be forgotten from one FMP to the next. Sudbury District MNR keeps a road strategy binder which ensures the road use strategy stays associated with a developing or developed road from FMP to FMP. The audit team thought this was a good idea and believed VFM would find a copy of the binder useful in doing its access planning.

Suggestion 7: MNR should provide a maintained copy of its roads strategy binder to VFM to facilitate planning and the updating of the road use strategies.

Harvest

The audit team found that the areas selected for harvest, renewal and tending operations were consistent with the defined eligibility criteria. Public information centres, meetings with various associations and organizations as well as with individual members of the public were used as forums to present and get feedback on the areas selected for harvest. Public input was considered in the development of the final areas selected for operations.

The total allocation by forest unit was consistent with the Available Harvest Area (AHA), however the allocation according to age class varies from the Selected Management Alternative (SMA) for several forest units, notably PO, MW2, PWUS and PJSB (% of allocated area outside of SMA ages – 87%, 66%, 58% and 56% respectively). The required SFMM analysis demonstrated that planned operations were consistent with the SMA – the amount and degree of age-class substitution did not jeopardize the achievement of FMP objectives or sustainability.

Nevertheless the planning team has recognized age class substitution as a concern for the next FMP and has discussed at length the contributing factors, most notably the need to create economically feasible operating blocks and constraints related to maintaining allocations within traditional operating areas. The audit team feels that significant levels of substitution have the potential to be an impediment to achieving FMP objectives but notes that a series of substitution prevention strategies were identified for implementation during the 2005-2010 FMP (Section 11.4.1.4). To ensure that age class substitution strategies are also included in the 2010-2020 FMP, the following recommendation is provided.

Recommendation 7: VFM must ensure that age class substitution prevention strategies are included in the 2010-2020 FMP.

The areas selected for harvest, renewal and tending are consistent with the selection criteria, with the exception of a very small area in the PO, PR and LWMX forest units that is outside of the minimum operability age. This area was identified and discussed in the FMP.

The 2005-2010 FMP identified 11,493 ha or approximately 1.7 years worth of harvest operations as contingency area, with the additional contingency area intended to serve in part to mitigate losses from the application of NDPEG. For perspective, during the 2000-2005 FMP period, the total area of contingency actually brought into the FMP for harvest was 344 ha out of a total contingency allocation of 4,862 ha (or 7%). A minor amendment for 199 ha of new allocation was made to replace a blowdown area because the contingency allocation did not have the right mix and area by forest unit.

The audit team is aware of NDPEG Q & A (June 24, 2003) which indicates that contingency areas would be a likely source of additional harvest area to balance against areas left in residual peninsulas, but the audit team is not aware of clear direction permitting an increase to the upper limit of identified contingency area. MNR reviewers at the district and regional level agreed to the identification of a higher than normal level of contingency in light of the fact that the degree of impact of NDPEG was and still is somewhat unclear.

The 2010-2020 FMP will be prepared according to the 2004 FMPM which requires sufficient contingency area to be selected to support a minimum of one year, and a maximum of two years of harvest operations for a ten-year planning period. By the time the 2010-2020 FMP is under preparation, there should be a much clearer understanding of the impacts of NDPEG and at that time a better ability to fine-tune the use of contingency areas and clarify FMPM direction. It is also recognized that additional planning costs are linked to higher levels of contingency, particularly with respect to increased staff review time, public notification costs, potential issue resolution costs and time related to values updating. Therefore the audit team makes the following recommendation:

Recommendation 8: During the preparation of the 2010-2020 FMP, VFM must abide by the requirements of the 2004 FMPM with respect to the identification of contingency area unless updated by clear direction related to the implementation of NDPEG.

The forecasted depletion area was shown in relation to AHA by forest unit as required in the FMPM, and in all cases the figures were quite consistent.

Harvest rights involving ten different shareholders and six independent operators were identified and addressed in the FMP. Note that additional discussion may be found in Section 3.8 of this report. Also note that the number of shareholders has changed.

Although there was some discussion of the hemlock looper infestation in the Killarney area, no salvage was predicted for the 2005-2010 period, and no tables in format of Table FMP-22 and Table FMP-23 were produced.

Recommendation 9: MNR and VFM must develop a strategy to ensure the sustainability of the hemlock resource on the Sudbury Forest, with considerations to include:

- a) inventory (including ability of the inventory to accurately reflect understorey hemlock occurrence, technologies to permit monitoring and updating in response to natural depletions).**
- b) renewal and recruitment strategies (including considerations used to prioritize silvicultural effort – for instance, ungulate feeding pressure).**
- c) pest management (occurrence, successional trends following disturbance, forest protection needs and strategies).**

Forecasts of revenues and expenditures were prepared. They reflect operations proposed in the FMP, and appear to be adequate to meet FMP objectives. As no salvage harvests were forecasted, a separate estimate of Crown revenues was not required. Charges, assumptions and ratios upon which the revenue and expenditure estimates were based were provided.

3.3.8 Plan Review, Approval

The 2005-2010 FMP was prepared in accordance with the approved timelines and the process for approval and amendments adhered to the FMPM requirements. The audit team confirmed the necessary signature approvals of the Plan Author, the District Manager and the Regional Director and the inclusion of the required FMP plan contributors' page. The plan contained a list of exceptions for 18 planned clearcuts larger than 260 hectares as well as two exceptions to the silvicultural guide.

3.3.9 Plan Amendments

There were 100 amendments to the FMP during the period of audit. Four of these were minor and required public notice and two were withdrawn or rejected. A review of the administrative amendments indicated internal review and approval periods for amendments were generally within an acceptable time frame.

The number of amendments during the audit period was relatively high, but reasonable given that most of the amendments were related to values additions or corrections (NRVIS), roads and AOC crossings, and modifications or changes to AOCs to reflect new values information. There was an increase in the number of amendments related to adding area for tending. Table 2 provides a summary of amendment by amendment type and category.

Table 2. Summary of amendments to the Sudbury Forest FMPs during the audit period (2001-2006).

Description of Amendment	Amendment Classification	
	Minor	Administrative
Contingency Swap		5
Harvest Area		3
Roads & Water Crossings	1	35
NRVIS	2	25
AOC Prescription Change		16
Renewal & Maintenance	1	12
Total	4	96

The FMPM requires that a record of all amendment requests and all approved amendments be maintained in a master list at the front of the FMP and that copies of major and minor amendments are distributed to all locations where official/approved copies of the FMP reside as soon as they are approved. Copies of administrative amendments are distributed once a year.

During the implementation of the 2000-2005 FMP, District MNR staff developed an electronic filing system for organizing and tracking FMP amendments and AWS revisions. In reviewing this system, the audit team noted that amendments numbers 45 through 60 in 2003-2004 were duplicated. Amendment numbers and records for 2004-2004 and 2004-2005 are therefore incorrect.

Recommendation 10: MNR must ensure that the FMP amendments master list is accurate.

3.3.10 Contingency Plans

There were no contingency plans developed during the audit term.

3.3.11 Annual Work Schedules

Several stands were selected from the field audit sites and were subsequently tracked from the FMP to the AWS. No discrepancies were noted.

All of the prescribed burns implemented during the period of the audit were low-complexity slash-pile burns. Planning requirements for the 2001-2002 to 2003-2004 season's prescribed burn programs were met as per the 1996 FMPM. No prescribed burns were planned for 2004-2005, however the planning requirements for the 2005-2006 prescribed burn program were met as per the 2004 FMPM.

Aerial tending plans were prepared for each year except for 2002-2003 when no program was scheduled. Requirements of the 1996 FMPM and subsequently the 2004 FMPM were met, although forest condition descriptions were brief, as were the rationale discussions.

The process for AWS revision and FMP amendments was followed according to the 1996 FMPM until March 31, 2005 after which the 2004 FMPM requirements were followed.

As required in the Guideline for Forest Industry Compliance Planning¹², each of the Annual Plans of Action provided a listing of compliance priorities with goals and strategies identified, a monitoring-inspection-reporting schedule, remedial action, and a brief discussion of compliance plan approval/review/amendment and evaluation procedures. Each Plan of Action also included an appendix which summarized critical issues associated with each harvest block, listing reminders related to such things as property boundaries, AOCs, the need to contact a cottage owners' association or the presence of regeneration requiring protection. This practice no doubt reduces the number and severity of potential non-compliances and aids in maintaining good relations with other users of the Forest.

Best Practice 2: VFM is commended for appending easily referenced tabular summaries of block by block compliance inspection priorities to the Annual Plans of Action.

The Forest Operation Prescriptions (FOPs) for harvest, renewal, and maintenance operations scheduled in the AWS were consistent with the SGRs and were prepared in accordance with the FMPM.

Documentation for revisions to FOPs and AWSs was included and was consistent with the corresponding SGRs and FMP. Several stands were tracked from the SGRs in the FMP. The FOPs for these examples were well done and completed before any operations commenced on site.

3.4 Plan Implementation

A crucial component of the audit involved field examination of a number of sites to compare results of activities with planned activities, enabling auditors to assess the achievement of FMP objectives and compliance with laws and regulations. The audit team was required to sample 10-20% of the range of activities undertaken during the period of the audit.

The audit team first identified all harvest blocks where at least one activity was implemented during the five-year period of the audit. The activities included harvest and renewal as well as areas identified as FTG during the period of the audit. Blocks in which harvest or renewal activities had occurred were further stratified. Harvest activities were stratified by forest unit, silviculture system, year of harvest, and licensee/contractor. Stratification of renewal activities included silviculture system, artificial or natural regeneration, forest unit, renewal method,

¹² MNR. 2005. Guideline for Forest Industry Compliance Planning. 17 p.

species targeted for renewal and year of renewal activity. AOC types were added to ensure representation of adequate AOC sampling in the field.

Sites for field stops were selected using the above stratification to ensure that every activity was represented proportionate to its implementation during the term of the audit. At least one stand location for each stratum was selected for field inspection at the pre-audit meeting. Additional locations were selected to represent the dominant strata types. Sampling of the most common AOC categories was completed. Within harvest blocks, road construction and water crossing installations were inspected to ensure adequate sampling intensity of these audit components. Sampling also included primary and secondary roads that were constructed or maintained during the audit term. All field inspection sites were selected by the audit team without assistance by VFM or MNR.

Specific problem sites identified during the document review period, pre-audit meetings and public involvement phases were also included for site inspection. Auditors evaluated information flow and used office and field procedures to validate the accuracy of the information found in the reporting documents (Annual Reports, Annual Work Schedules and Report of Past Forest Operations). VFM prepared a set of background information for each block in the audit team's field sample which included maps, FOPs, location of roads, AOCs, and Forest Operations Inspection Reports (FOIR).

3.4.1 Areas of Concern

The audit team observed a wide variety of AOC prescriptions including some to protect broad-winged hawk nesting sites, MAFAs, water quality and fish habitat on warm and cold water streams and lakes, viewsheds along canoe routes, cultural heritage trails etc. (Figure 6).



Figure 6. Moose aquatic feeding area protected by an AOC prescription.

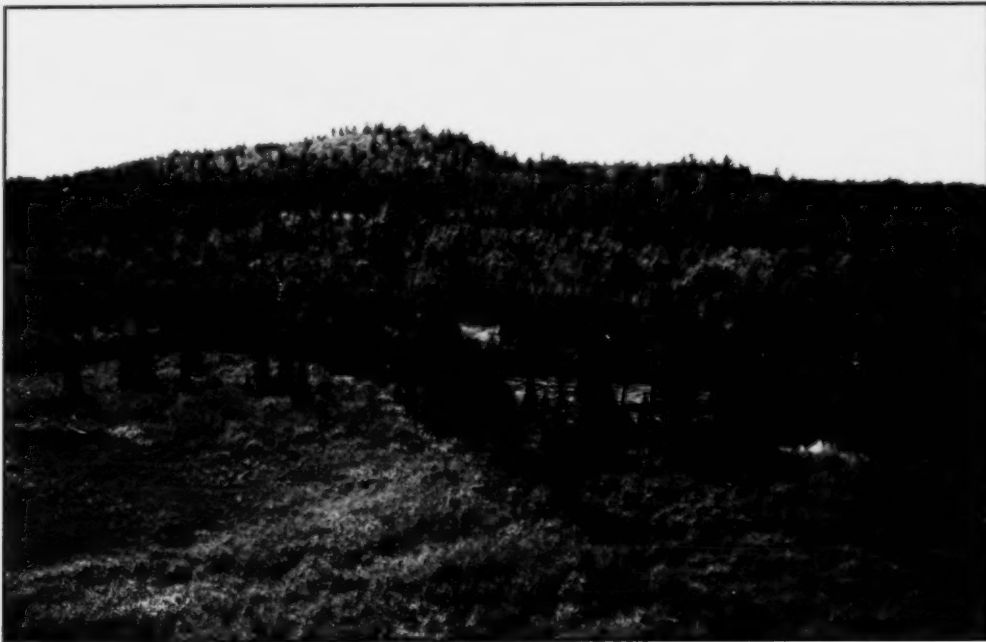


Figure 7. Effective application of a prescription to maintain "skyline" aesthetic values (background) within the viewshed of a canoe route (foreground) in an enhanced management area.

AOC prescriptions followed specific direction within a guideline where that was available (e.g. Timber Management Guidelines for the Protection of Fish Habitat¹³). When the planning team needed to devise a prescription that would protect a value where specific direction was not available in a guideline the audit team's opinion was that the value had been adequately protected and the prescription was appropriate for the site conditions encountered. There were a number of these situations on the Sudbury Forest (e.g. maintenance of aesthetic values proximate to a canoe route in an EMA (Figure 7), cultural heritage trails, biodiversity concerns on waterbodies within trapline areas, developed cottage lakes). These prescriptions often reflected obvious consultation with affected stakeholders.

The audit team observed that prescriptions were carried out as planned or modifications were covered by an amendment or compliance report detailing the difference from the planned prescription. Where AOC non-compliances were noted, they were usually minor in nature. The audit team saw one example where winter skidding had occurred along a known stream resulting in a repair order that was successfully carried out by the contractor.

3.4.2 Harvest

The audit team selected a sample of areas harvested during the audit period that was representative of the forest types, silvicultural systems and seasons of operation employed on the Sudbury Forest. All areas chosen for inspection were approved in the respective FMP and associated AWSs, and were consistent with the SGRs. Although the full-tree logging of fine-branched species in partial cut operations was noted in the FMP as an exception to the ground rules that may be utilized on the Sudbury Forest, the approach was not planned for implementation during the audit period (an unplanned occurrence on a limited area did occur and was recorded as a non-compliance). No other exceptions to the SGRs were noted. All prescriptions were appropriate for the specific site conditions.

¹³ MNR. 1998. Timber Management Guidelines for the Protection of Fish Habitat. 14 p.

VFM has an effective slash management program on most areas, and in fact all prescribed fires planned and implemented during the period of the audit were related to low complexity slash pile burns. The audit team noted examples of skidways where tops were piled rather than burned, resulting in the loss of productive area for silvicultural treatment. VFM staff expressed concern related to the proximity of several of these sites to highways and/or homes, and was therefore reluctant to use fire. Nevertheless the audit team is aware of the successful use of prescribed fire in similar situations on other forests.

Suggestion 8: VFM should explore slash management opportunities, including low complexity slash burns, in areas where tops were piled rather than burned due to concerns over proximity to highways and/or homes.

Where deviations from approved operations occurred, the appropriate amendments or revisions were made. Operations were consistent with site conditions.

Operations on the Sudbury Forest were generally conducted in such a way that site disturbance was minimized. Few instances of severe rutting were observed during the field audit, and those were noted in the FOIP reports and dealt with. Two repair orders and a single instance of penalty assessment resulted from compliance issues related to site damage during the five-year audit period. VFM staff informed the audit team that operators are now much more sensitized to the increased potential for rutting during wet weather, and usually move on their own accord from damage prone sites before problems develop.

VFM was diligent in dealing with instances of poor utilization within harvest blocks. Cases of high stumps and notations related to "*wood to be cleaned up*" were included in the FOIP reports where necessary, and occasionally were brought to the attention of the compliance committee from which warnings and in a few cases compliance orders have resulted. Marked but unharvested residual trees were noted in several of the shelterwood blocks.



Figure 8. Unutilized wood left at roadside.

In all cases the material was small diameter (although meeting CFSA standards), generally not in sufficient quantities to hinder silvicultural treatment, was noted in the FOIP reports, and was dealt with effectively by VFM. In one case the operator was required to return to the site twice to remove residual standing timber. The audit

team noted only one case of poor log making leading to an unreported utilization problem at a landing (Figure 8). In that instance, heavy snow at the end of the operating season had buried much of this material, making a thorough final inspection difficult. Overall, utilization within the harvest blocks on the Sudbury Forest was acceptable.

Residual stems are prone to damage during logging in the partial cut systems, however damage levels were under control on the Sudbury Forest. Damage to residual trees (other than to established regeneration) was seldom mentioned in the FOIP reports, nor was significant damage noted on any of the partial cut areas during the field audits. It appears that a combination of ongoing operator training, compliance work on the part of both VFM and MNR, and a shift to well implemented mechanized operations was effective in keeping this potential problem at acceptable levels.

Harvest operations were generally in compliance with approved operations. Specific non-compliances have occurred, and serious cases (e.g. dealing with excessive site damage, trespasses into AOCs, harvesting without approval, cutting unmarked trees or damage to regeneration) resulted in compliance orders or penalties.

3.4.3 Renewal

As part of the field audit, the audit team observed a variety of silvicultural treatments that were implemented on the Sudbury Forest during the audit period. These included tree planting, aerial and manual chemical tending, chemical site preparation, pre-commercial thinning in red pine and even-aged natural regeneration after clearcut. The renewal activities and SGRs were approved in the FMP and the AWSs except one case where red spruce was planted and not included in either the SGRs or AWS. A recommendation regarding this is included in Section 3.3.7 of this report. The renewal activities were consistent with the FOPs and were generally appropriate and effective for the specific site conditions. The renewal activities were also consistent with information reported in the Annual Reports. There was one exception to the SGRs regarding the full-tree logging of trees in partial cuts. A detailed monitoring program is in place in the 2005-2010 FMP. This is discussed further in Section 3.6 of this report.

The achieved levels of renewal activities appear low when compared to the planned levels. This is primarily due to only 50% of the available harvest area in the 2000-2005 FMP actually having been harvested and therefore limits the usefulness of a comparison.

A total of 3,914 ha of natural regeneration under VFM's clearcut with standards silvicultural system was reported for the 2000-2005 planning term, with the planned area being 6,657 ha. Shelterwood tree marking was done on 6,575 ha compared to the 10,059 ha forecasted in the FMP. These combined figures shows 63% of planned area was completed and actually represents the amount of tree marking done with the expectation of natural regeneration. Although planned for natural regeneration, no modified cuts in AOC strip cuts, seed tree cuts or CLAAG were done during the audit period.

Artificial regeneration activities during the 2000-2005 period included the planting of over 11 million trees on both clearcut harvest areas and as supplemental treatments on areas harvested under the shelterwood system. In most cases, where planting was done there were also natural volunteers of either spruce, jack pine or white pine observed. In spite of the low area harvested, a total of 7,836 ha (84% of the five-year FMP forecast) was planted. An additional 2,945 ha was planted through the Forestry Futures Trust funded project referred to as the Sudbury Land Reclamation Project. This project supports active reforestation of the area around the City of Sudbury that was damaged by smelter fallout.

Since 1998, VFM has conducted fall tree plants which begin around August 15 and ran to the end of September. Preliminary findings show good results and VFM staff cite several advantages:

- Experienced tree planters are available in late summer, early fall.
- Winter harvesting roads, which are often impassable during the spring, have dried out and provide better access.
- Planting stock is often cheaper in the fall.

The examples seen in the field showed healthy trees. VFM is monitoring these sites and has established permanent sample plots to measure seedling survival and growth.

No aerial seeding was undertaken during the five year period of the 2000-2005 FMP although 307 ha were planned.

During the implementation of the 2000-2005 FMP there were lower levels of mechanical (43%) and chemical (37%) site preparation completed relative to the area forecast. This was partly due to VFM planting sites directly after harvest rather than using site preparation first where possible. Also, ground chemical site preparation was less than planned because a large portion of allocated pine shelterwood was not harvested. Power disk trencher and skidder mounted rakes were used to mechanically site prepare 1,110 ha or 43% of the five-year forecast.

During the 2005 season, 1,131 ha of chemical site preparation was completed by aerial spraying, skidder mounted air blast sprayers and backpack foliar application. The audit team observed good results of back pack foliar application of Vision[®] and VisionMax[®] which was tried for the first time in 2005 by VFM. The contractor treated 253 ha for site preparation.



Figure 9. Example of chemical site preparation using air blast sprayer to control poplar competition. (Note invasion of site by jewelweed)

Results of 2005 air blast spraying used as chemical site preparation to control poplar under a white pine shelterwood harvest was also seen on the field audit. The effects on controlling poplar were very good. Unfortunately, jewelweed (touch-me-not) had become established and the newly planted small white pine seedlings were well overtopped by these dense plants (Figure 10). It is VFM's preference to spray one year after harvest and plant the next year. However, it took several years to complete the harvest on this block, during which time jewelweed became established. It is important for VFM to monitor the survival and growth of these white pine seedlings for future treatment if needed.

Suggestion 9: VFM should consult with MNR Science and Information experts regarding competition control on sites where jewelweed compromises conifer renewal.

Recommendation 11: VFM must ensure that sites where jewelweed compromises conifer renewal are monitored and treated to ensure survival and growth.



Figure 10. White pine seedling overcome by jewelweed.

Prescribed burns for site preparation were not used on the Sudbury Forest during the audit period. An area of 159 ha was reported as slash pile burning.

Only one compliance issue was found regarding a fall tree plant. The company inspector found the inspection to be not in compliance, and the MNR spot check found the status to be not in compliance with comments. The Company inspection report revealed that trees were poorly planted initially but that quality improved over time to above acceptable levels at the end of the plant. However, trees were being intentionally hidden by tree planters throughout the plant. This particular contractor was new to tree planting and required more supervision throughout the tree plant but, particularly at the beginning of the operation.

Suggestion 10: VFM should ensure that increased supervision and training of tree planters be done where a contractor is new to tree planting.

3.4.4 Tending and Protection

The tending and protection activities on the Sudbury Forest included manual tending, ground and aerial herbicide spraying, and red pine pre-commercial thinning. No protection (insect pest control) activities were planned or carried out. Again, levels were generally lower than planned due to the 50% reduction in actual harvested area compared to planned. The tending activities were consistent with the FMP including the SGRs and the FOPs, and

were approved in the AWS. Tending activities were also appropriate for the specific site conditions and consistent with information in the ARs. Where changes from originally approved activities occurred (e.g. the addition of four red pine thinning areas in 2005) appropriate amendments or revisions were made.

Manual brush saw tending was done over the five-year period of the 2000-2005 FMP, completing 511 ha or 43% of the area forecasted. Chemical aerial tending by helicopter was done on 53% of the 2000-2005 planned area (including 208 ha on salvaged blow down area). In 2005-2006, 647 ha were completed. Field examinations showed aerial spraying application to be well done and the results effective (Figure 11).



Figure 11. Example of effective aerial spray treatment.

Most of the ground chemical tending application was done using skidder-mounted air blast sprayers on 1,973 ha (including 58 ha on salvaged area) or 34% of the 2000-2005 FMP planned area.

During 2004 and 2005, the first two years of a three-year Forestry Futures Trust funded red pine pre-commercial thinning project was completed. This accounted for 1,375 ha of thinning work which was not planned for in the FMP. An amendment was made to the FMP to allow this work to be conducted. The objective was to improve sawlog quality and increase growth (Figure 12). The work was well done and results should yield improved sawlogs in the future as subsequent thinnings are carried out.



Figure 12. A red pine pre-commercial thinning project funded by the Forestry Futures Trust.

The Sprout-Less™ brush saw technique was used on 26 ha in 2005. As the brush saw cuts the stem an application of Vision® is wiped onto the freshly cut stems and kills or reduces the suckering ability of the tree.



Figure 13. Example of hardwood competition sprouted one year after use of Sprout-Less™ brush saw.

The results observed in the field were less than desirable (Figure 13). It is reported to be useful where broader aerial spray or air blast cannot be used or for areas where individual stems are targeted for removal or for small areas where the stems are too tall for backpack sprayers. It worked occasionally to kill the stems of the competition but on the observed site hardwood competition had sprouted the next year, requiring aerial spaying over the same area to control the competition (Figure 14).



Figure 14. Examples of sites where aerial spraying is required.

3.4.5 Renewal Support

VFM inherited a large inventory of seed from MNR when it took over management of the Sudbury Forest in 1998 and therefore has not required a major cone collection program during the 2000-2005 FMP period. Nurseries have experienced problems with poor viability with white pine and white spruce and VFM would like to replace this seed with fresh seed. Cone collection is planned in certain seed zones in the 2005-2010 FMP for white pine, red pine, jack pine, white spruce and black spruce.

There are three jack pine tree improvement areas on the Sudbury Forest including a seed orchard and a progeny test in Lumsden Township, and a second progeny test in Street Township. The Northeastern Seed Management Association has all three areas categorized as "inactive", but they are not abandoned. No activities are planned for these areas in the 2005-2010 FMP.

3.4.6 Access

The audit team sampled a selection of access activities for primary, secondary and tertiary roads (road construction, road decommissioning, road maintenance, various types of water crossings (i.e. winter, normal culverts, "box" culverts and portable bridges) from those areas where activities had been conducted during the five-year period of the audit (Figure 15). All road building activities were as planned or were covered by an FMP amendment.

The audit team was required to examine a sample of road maintenance work which was invoiced under agreement funding for the year ending March 31, 2006. The audit team is satisfied that work for which invoices were submitted (e.g. gravelling and culvert replacement on the Nadon Road; culvert replacement, grading, gravelling on the Portelance Road) was carried out. The audit team could not check invoiced work for snowplowing/sanding of roads.

Water crossings were generally well done with proper diameter culverts, culverts long enough to allow appropriate sloping of the road shoulders, rock rip-rap around the culvert, proper embedding in the stream bed, etc. Where roads were planned to be decommissioned, one contractor used "box" culverts which consisted of two sill logs or timbers bridged by squared timbers and covered with gravel. These structures presented similar advantages to miniature portable bridges in that stream bed disturbance during installation or removal of the structure was not required.

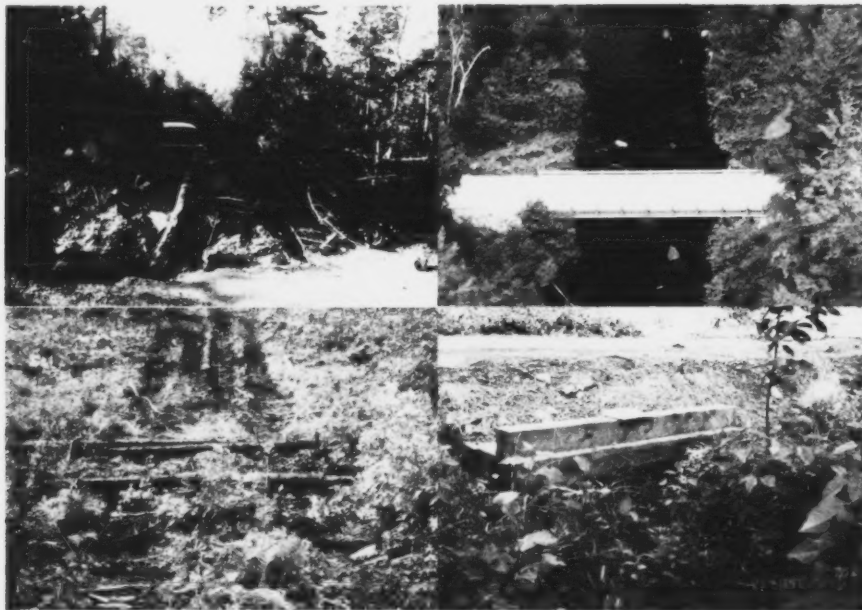


Figure 15. Clockwise from top left: Decommissioned road with berm; portable bridge on the Nelson River; box culvert; sill logs for a winter skid bridge over an intermittent stream.

Portable bridges from small "skid" bridges used on tertiary roads or skid trails to large bridges across rivers were used to good effect on the Forest. Many of the decommissioned roads the audit team examined had had portable bridges or "box" culverts removed.

The audit team visited one winter-only operation in an area of fine textured soils. Although water crossings were well done, erosion of the road surface had occurred where the sloped approaches to the crossing were moderate to steep.

Recommendation 12: VFM must ensure contractors use water bars on ungravelled secondary and primary winter roads once operations are completed where there are moderate to steep approaches to water crossings.

Category 9 and 14 aggregate pits were examined (Figure 16). Two of the three Category 9 pits examined were not in compliance with regulations under the Aggregates Resources Act¹⁴; one had no boundary marking, no overburden removal and storage, steep pit slopes and excavation below the ditch line beside the access road while the other had incomplete overburden removal.



Figure 16. A good example of a Category 9 gravel pit (above) with overburden removed and stored (below).

While most Category 14 pits met requirements, some could have had better pit sloping and overburden removal and storage. The audit team saw good examples of pit rehabilitation in Category 14 pits.

Recommendation 13: MNR must ensure that aggregate pit permittees for pits used for the construction and maintenance of forest management roads on the Sudbury Forest comply with the requirements of the Aggregates Resources Act.

¹⁴ Aggregate Resources Act, R.R.O. 1990, Reg. 171

Effective access control is an issue on the Sudbury Forest as it is on many forests where there are conflicting interests for resource use. The audit team saw one example (Kukagami West Road) where signage, road decommissioning, a series of berms, and slash distribution on sections of the road were used to prohibit motorized use. These efforts were effective to date but the impediments to motorized travel have not been in place for long.

At another location (Carafel Creek) a portable bridge was installed and removed four times over four planning periods (20 years) to restrict motorized travel down the Davis Road. This appears to have been ineffective in part because the road was supposed to have been closed over 15 years ago but efforts to control access were restricted primarily to periodically removing the portable bridge and limited signing and berming of the road. Recreationists have had access to the area beyond the bridge for many years and now, although standard vehicles were stopped with aggressive berming, ditching and signing of the road, ATV users are still able to access points beyond the bridge removal (Figure 17). However, enforcement is being tightened.



Figure 17. Example of ATV access continuing even after aggressive measures have stopped normal vehicular access on the Davis Road at Carafel Creek.

On the Lower Goose Falls road, signs prohibiting access and a gate were erected as soon as the road was built and to date there were no major problems with this road closure. These examples on the Sudbury Forest demonstrate that any chance of successful access control requires early notification to the public in the FMP and on the road as soon as it is built. Early notice should be followed up with effective physical deterrents as soon as the road is built (e.g. a gate).

Suggestion 21: VFM and MNR should work together to ensure effective strategies (e.g. early signing, gating, careful road placement etc.) are employed to restrict vehicular access where that is the use management strategy.

3.5 System Support

3.5.1 Human Resources

Effective communication amongst individuals involved in forest management is crucial to ensuring operations are conducted in accordance with the approved FMP. The audit team observed an effective communication system in place on the Sudbury Forest, in terms of communication amongst VFM staff and contractors. Inter-organizational communication between VFM and MNR was particularly effective.

Employees must be well trained to ensure they are aware of current, relevant legislation, industry and government regulatory requirements and standards, and the organization's policies and objectives. Interaction with VFM and MNR employees during the site visit indicated that adequate training opportunities were made available to staff.

Training needs and records for MNR staff were documented in individual annual performance review files. Training needs for individual employees at VFM were discussed annually and training records for employees were stored in a training records binder.

3.5.2 Documentation and Quality Control

The preparation, distribution, collection and maintenance of forest management documents and records was well done by VFM. Records were up-to-date. Files and binders of information were well organized and easily retrieved. VFM has project library key maps and information of completed projects and AWS maps by project type organized and available in binders. Older files and previous FMPs were stored together and retrievable. All information was available on CD in the office as well. MITIG Forestry Services Ltd. in Calander keeps and updates all data including all GIS information. Back-up of MITIG data files are kept off-site. An FTP site is used to pass large files to MNR and the planning forester in Calander. Compliance information is entered, stored and retrievable from the MNR web site. Computer information in VFM office is backed up and stored off-site.

MNR documents were found to be organized and easily accessible to the audit team. The preparation, distribution, collection and maintenance of forest management documents and records was well done. The current version of required information was readily available when requested by the audit team. The records and documents were kept up-to-date, with the exception addressed with Recommendation 2.

3.6 Monitoring

3.6.1 General Monitoring

Compliance

Compliance monitoring of forestry activities is a joint responsibility of the forest industry and MNR. While both parties are responsible for compliance, SFL holders have the lead role in forest compliance planning, conducting inspections, the identification of compliance and non-compliance, reporting to MNR, performance of corrective measures and future preventative measures to ensure improvement, as well as training and education in all areas of forest compliance. The role of MNR is focused on the regulatory aspects of forest management including monitoring, auditing of industry compliance inspections, assessing non-compliance significance, and determining corrective and enforcement action.

Sudbury District MNR prepared a five-year District Compliance Plan for the period September 1, 1998 to March 31, 2003 which addressed forest compliance in addition to the compliance requirements of the other branches (Lands, Fish and Wildlife, etc.). No five-year District Compliance Plan was prepared for the period commencing April 1, 2003. This gap is noted by the audit team, but because such plans are no longer required as of March 31, 2006, no related recommendation is submitted. Annual Compliance Operation Plans were developed for each year of the audit period.

The MNR District Compliance Plan, as well as the Annual Compliance Operation Plans (ACOP), provide details on staffing, targets for the inspection of harvest and renewal activities, and the roles, responsibilities and procedures of the Area Compliance Committee. Particular attention and targets for monitoring activity was given to water crossings, reported non-compliance and repair orders, spot inspections of each operator, and the more complete compliance audits which focus on one or two specific operators in each year.

The level of harvest monitoring by MNR staff was generally consistent with the ACOPs, with three to four inspections targeted per operation, and more on blocks of 1,000 hectares or more. Water crossings tend to receive a higher level of attention than the ACOPs indicate because compliance staff recognize them as a potential source of concern. In addition, joint inspections including both MNR and VFM staff are supported by both organizations, particularly in cases of observed non-compliance. This has been an effective method of ensuring consistency in the interpretation of the CFSA and other relevant legislation.

Section 16.0 of the 2005-2010 FMP includes a discussion of the monitoring programs to be implemented over the five-year period of the plan. A Compliance Strategy and Plan for the Sudbury Forest (2005-2010) was completed by Vermilion Forest Management in accordance with the SFL condition and consistent with the Guideline for Forest Industry Compliance Planning. This plan provides objectives and strategies, addresses planning and resource protection, education, training and communications, monitoring and reporting, as well as efficiency of compliance activities and continuous improvement. The required Annual Plans of Action detailing specific annual expectations were completed as well.

Table 3 provides a summary of compliance monitoring activity over the five-year audit period. Over 900 compliance inspections were completed by VFM and MNR.

Table 3. Summary of compliance monitoring activity performed by VFM and MNR over the five-year audit period on the Sudbury Forest.

Year	Access	Harvest	Renewal, Maintenance & Tending	Total Inspections	Non- Compliances Reported	% Compliance
Summary of Compliance Inspections Undertaken by VFM						
2001-2002	22	97	14	133	10	92.5
2002-2003	13	97	11	121	8	93.4
2003-2004	10	56	18	84	6	92.9
2004-2005	7	62	17	86	10	88.4
2005-2006	9	49	11	69	10	85.5
Total	61	361	71	493	44	91.1
Summary of Compliance Inspections Undertaken by MNR						
2001-2002	20	67	9	96	13	86.5
2002-2003	19	70	13	102	12	88.2
2003-2004	20	50	5	75	6	92.0
2004-2005	13	54	10	77	5	93.5
2005-2006	7	49	14	70	8	88.6
Total	79	290	51	420	44	89.5

The actual level of the overall monitoring program is appropriate. Non-compliant activities were recorded and dealt with during the normal monitoring program. All of the harvest blocks included in the field audit had at least one and usually several compliance inspection reports completed and on file. Only one unreported harvest related non-compliance (wasteful practices at a log landing) was noted during the field audit. In addition to regular monitoring of harvest related activities, assessment of regeneration success on 39,451 hectares and monitoring of plantations through permanent sample plots was also planned.

It is worth noting that the number of planned inspections forecasted in the Annual Plans of Action is consistently higher than the actual number of compliance reports submitted. Reasons for the discrepancies are provided, and include market changes, failure of operators to commence operations when scheduled to, or the occasional consolidation of more than one inspection into a single Forest Operations Inspection Report. In fact, both the company and MNR sometimes batched inspections, completing two or three inspections before submitting a final report. Overall, the primary target of conducting one compliance inspection on each operator for each month of operation was being met.

Forest Operations Inspection Reports indicating a non-compliance situation were consistently submitted within two days, as specified in Forest Information Manual (FIM). However, because of the occasional batching of in-compliance inspection reports, FOIRs summarizing two or three inspections over a period of several weeks were noted. In fact, the audit team observed a few examples of in-compliance FOIR's submitted two to three months after the first inspection. Therefore, the audit team makes the following recommendation.

Recommendation 14: Both MNR and VFM must ensure that FIM timelines for reporting are met.

Renewal

VFM carries out plantation performance assessments to determine height and survival of new plantations. This information, along with visual inspections, is used to determine the need for planting refill and/or competition control.

Regeneration surveys were conducted using a variety of techniques. For homogenous areas of regeneration, ocular assessments of the regeneration by trained/skilled forester/technician were used. This was done on the ground or from a helicopter. For areas where there was a greater variability in regeneration success and species, a more detailed on the ground sampling procedure was used. Results from regeneration surveys were used to update the FRI. MNR staff accompanied VFM on helicopter surveys to verify survey results.

The area forecasted to be assessed for FTG in the 2000-2005 FMP was 27,515 ha. The 2001-2002 AR reported that no regeneration assessments had been done. The 2002-2003 AR reported that 12,345 ha of FTG was assessed. The text described that much of the back log FTG was caught up by VFM. It was also reported that over 5,000 ha of this area was older barren and scattered or mistyped older stands which were then re-entered into the inventory. The 2002-2003 AR and the 2003-2004 AR were an inaccurate representation of the actual FTG survey work done since they included FRI update information. The Action Plan responding to the 2001 Sudbury Forest IFA reported different survey area totals being completed during 2003 and 2004 compared to the ARs. These totals also included the FRI updates. VFM made corrections to the actual FTG area assessed, area successfully regenerated and area not successfully regenerated in the 2004-2005 AR. When considering that 50% of the planned harvest was actually cut, the true target for assessments was 13,758 ha for the 2000-2005 period. The assessment results show that 67% of the target area was assessed, and of the area assessed 95% was FTG.

The area of regeneration identified to be assessed in the 2005-2010 FMP was 39,451 ha. It is important that VFM continue to work at completing the FTG assessments to bring the inventory up-to-date before the next planning period begins.

Recommendation 15: VFM must ensure that Free to Grow surveys are completed and that record keeping and completion of Annual Report Table AR-14 is done correctly.

VFM recently developed a FTG survey method called FOREcaST to estimate the forest condition at the end of the renewal stage. Competition interference is assessed as part of the survey, which can be used to determine the urgency and type of intervention that is required to bring the forest stand to a FTG state. This survey should assist in determining FTG status and the need for remedial action.

The overall monitoring program on the Sudbury Forest was in accordance with the FMP and appropriate to measure the effectiveness of the silvicultural treatments. The 2000-2005 and 2005-2010 FMPs included an exception to the SGRs which allows the full-tree logging method of fine-branched species in the preparatory and seed cut stages of partial harvest systems for several forest units. The 2000-2005 FMP relied on regular compliance inspections to monitor this exception, whereas a more detailed and complete monitoring program for it was included in the 2005-2010 FMP.

3.6.2 Annual Report

The spring (due April 15th) and fall (due November 15th) components of the Annual Reports (ARs) for the 2000-2004 period were examined. No spring report was required for 2004-2005 as the fall report was to incorporate the required reporting in the new Year Ten Annual Report reporting format put forward in the 2004 FMPM. Since not all requirements for the Year Ten Annual Report could be met, only those requirements that are "reasonably possible" would be expected.

Two spring reports were submitted late by a matter of days, and two fall reports were late, one by two weeks. The 2004-2005 Year Ten Annual Report was two months late due to a vacancy in VFM's planning forester position.

Recommendation 16: VFM must make every effort to ensure that timelines for reporting requirements, as put forward in the new Forest Management Planning Manual (Phase-in) and Forest Information Manual, are met.

The ARs summarized instances of non-compliance, and included details related to the number of inspections made, number and types of infractions, any relevant rationale for the infractions, a measure of significance, and steps taken to address the situation.

Compliance levels achieved during the five-year term of the audit were very consistent in both VFM and MNR Forest Operations Inspections, averaging close to 90% in both cases. The actions taken appear to be appropriate, ranging from warnings and repair orders in the cases of relatively minor non-compliances or for operators with a good track record, to penalties for more serious infractions (unauthorized harvest, roads outside of the approval area, damage to regeneration, serious rutting) or situations where there was a history of non-compliance.

Annual Reports were generally found to be complete and accurate however the audit team did note some deficiencies:

- Reports on the exception monitoring program for full-tree logging in PWUS, HDUS, LWMX, CE and HE forest units (for prep and seed cut stages of management only) were not included except in the 2004-2005 Annual Report.
- Table AR-3, a new requirement in 2003-2004 reporting on planned clearcuts, was not included in the 2003-2004 or 2004-2005 reports. Although the Company makes an argument as to why, in their opinion, Table AR-3 is not practical, the audit team has seen it done in other transition forests (e.g. the Algoma Forest).
- Generally the ARs did not have a "Conclusions" section where progress towards objective achievement and emerging trends were discussed.

Recommendation 17: VFM must ensure that Annual Reports meet all requirements as identified in the 1996 FMPM or as phase-in requirements under the 2004 FMPM.

The MNR-authored report on negotiations with Aboriginal communities, required under T&C 77 (now Condition 34 of the Class EA Declaration Order), was produced each year during the 2000-2005 period. The report usually consisted of a table showing economic benefits and/or fibre allocations to different Aboriginal communities and a separate text document describing discussions that may have taken place that year amongst MNR, Aboriginal communities and industry.

3.6.3 Report of Past Forest Operations

Monitoring of forest sustainability under the 1996 FMPM is scheduled to occur when implementation of an FMP is completed and the Report of Past Forest Operations (RPFO) compiled. The RPFO would look at a suite of 14 indicators, compare the levels before and after FMP implementation (and levels recorded in previous FMPs) and make a determination as to whether the indicators were moving in a positive or negative direction with respect to FMP objectives and forest sustainability.

The 2000-2005 FMP was the first prepared by VFM under the 1996 FMPM. The RPFO following the completion of this FMP would have established baseline levels for nine of the 14 indicators that would be used in the future for forest sustainability assessment. Five indicators used in the development of the 2000-2005 FMP had baseline levels already recorded and were assessed for change. The 2004 FMPM has replaced RPFOs with Year Three, Year Seven and Year Ten Annual Reports. FMPs created under the 1996 FMPM were to produce a Year Ten Annual Report in 2004-2005 instead of an AR to the extent that it was practical and reasonable wherein the plan author would do an assessment of sustainability using indicator data from past and current FMPs. The audit team noted two deficiencies in the Year Ten AR but generally the report demonstrated that indicator data were being collected as required.

Ontario has an effective policy and legislative framework intended to ensure that forests are managed sustainably. The backbone of Ontario's forest sustainability assessment is the long term monitoring of indicators for change. The audit team notes that the suite of indicators changed from the 1996 to the 2004 FMPM and believes it is important to ensure that these indicators remain constant to permit monitoring and assessment of sustainability over the long term.

Suggestion 32: MNR should consider stabilizing the suite of indicators used to assess forest sustainability.

Direction provided in the 2004 FMPM required VFM to produce and submit a Year Ten AR by November 15, 2005 to the District Manager. If revisions are required (within 30 days by the District Manager) the revised report would have been due February 15, 2006. The copy that was reviewed for this audit has a date on the cover page of March 31, 2006 while it was stamped and dated by the successor to the plan author on June 27, 2006.

VFM underwent a staffing change to the position responsible for preparation of the Year Ten AR in mid-November 2005, as this report was coming due. No replacement was hired until mid-February 2006. The draft Year Ten AR was submitted June 27, 2006. MNR gave notification the week of July 27, 2006 that it would prefer the draft report to be rescinded and re-submitted August 1, 2006 as no one at the District office was capable of reviewing the report within the 30-day window required in the 2004 FMPM. Recommendation 16 is provided to address this matter.

A sample of data contained in the Year Ten AR was examined for all ARs from 2000 through to 2005. The data contained in the 2004-2005 Year Ten AR was an accurate reflection of the data contained in the tables for the previous four ARs.

The report discusses low utilization rates for the 2000-2005 period (see Figure 18). Several reasons for the under-utilization were provided as follows:

- The softwood lumber dispute with the United States, which has affected all softwood lumber markets including those for red & white pine lumber.
- Low pulpwood prices which has limited the ability to economically harvest the many low quality/low volume stands found on the Sudbury Forest.
- The inability of some licensees to harvest their allocations (especially G.W. Sutherland Contracting & N'Swakamok Forestry Corporation).
- Licensees such as Goulard Lumber choosing to harvest its allocations on other forests rather than on the Sudbury Forest.

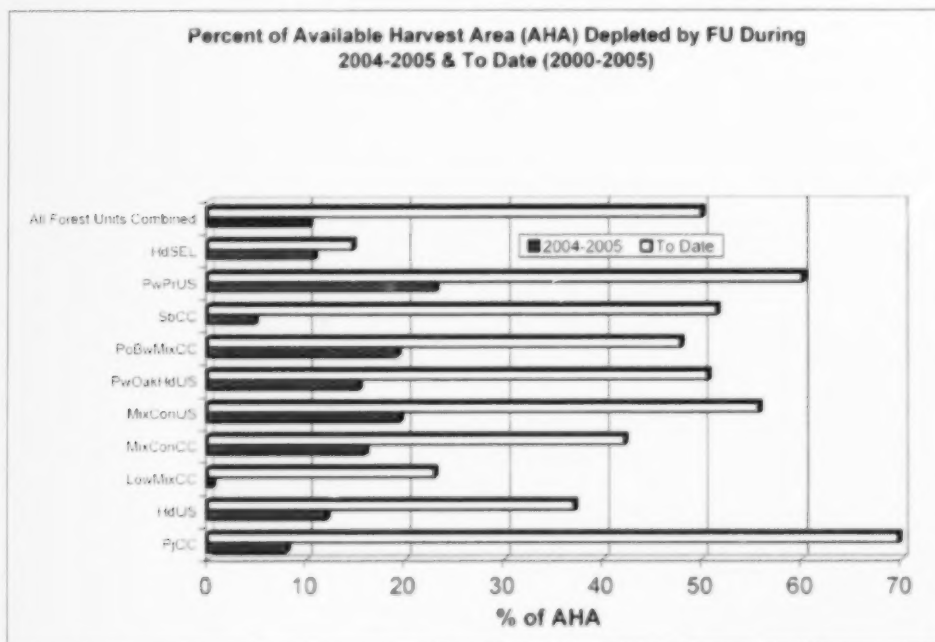


Figure 18. Percentage of AHA depleted by forest unit within the 2004-2005 fiscal year and to date. (Source: Year Ten Annual Report.)

It is noteworthy that although 48% of the Available Harvest Area (AHA) was depleted, 64% of the anticipated harvest volume was realized. This discrepancy reflects the fact that forest units with higher yields (e.g. PjCC FU) and more readily marketable products are harvested at levels much closer to the AHA than are many of the lower yielding forest units (e.g. HdSEL, LowMxCC and HdUS FUs) with their typically lower quality / lower value products and inconsistent markets. Due to the low depletion rates, all other prescribed activities showed lower actual than planned levels, as expected.

Efforts to deal with the under-utilization of lower quality and/or low value material was addressed by VFM and MNR, with considerations such as planning for the development of access towards older stands in the northern part of the Forest, developing fuelwood strategies, or making available low-quality stands on one Overlapping Licensee's traditional area to others who may have developed a market. These efforts were successful in terms of improving utilization within harvested stands, but have not significantly improved the ability of VFM to access and market a higher proportion of the AHA. This will impact on the ability of forest managers to meet a whole range of FMP objectives. The audit team feels that this issue is one of regional proportion, and therefore makes the following recommendations:

Recommendation 18: The MNR Industry Relations Branch, Forests Division must examine overall utilization in the Great Lakes - St. Lawrence Forest Region and actively pursue direction that increases utilization of lower quality fibre.

Recommendation 19: VFM must, during the preparation of the 2010-2020 FMP, use the tests of sustainability to examine the long-term implications of harvest operations on the Sudbury Forest continuing at their current level (i.e. social/economic impacts and impacts on wildlife habitat, etc.) so that it may quantify and better understand the impacts of this lost opportunity.

The only trend mentioned in the Year Ten AR directly was related to site preparation. *"The trend away from site preparation to directly tree planting in cutovers continues to be evident in the low proportion of mechanical (43%) and chemical (37%) site preparation completed relative to forecast."*

The 1995-2000 RPFO indicated that assumptions made through the analysis of implementation of the chosen management strategy (based on previous timber management plans) were generally appropriate, except assumptions related to demand by product, NDPEG landscape pattern and residual, utilization of poplar and jack pine, and need for an environmental quality objective. Modelling for the 2005-2010 FMP addressed all issues related to the strategic modelling assumptions that were identified in the 1995-2000 RPFO.

The review of Forest Modelling Assumptions in the Year Ten AR suggested that continual improvement of growth and yield, natural succession and silvicultural effectiveness data will occur as more information is available through time. All strategic modelling inputs would be reviewed during preparation of the 2010-2020 FMP. No specific problems with modelling assumptions were identified in the AR.

The Year Ten AR includes a complete and detailed review of the renewal and tending activities from 2000-2005 and included a discussion on the amount of operations to-date. Almost all of the levels of renewal achievements were lower than planned. It was reported that this was due to the low harvest level, which was only 61% of the planned harvest volume, or 50% of the planned harvest area. When the actual regenerated area (17,578 ha), is compared to the actual harvest area (14,488 ha) it can be seen that regeneration levels were high (121% during the 2000-2005 period).

Figure 19 summarizes the total area in the 2000-2005 FMP planning term where silviculture operations occurred or where areas were scheduled for natural regeneration. In summary, a total of 27,629 ha of productive forest area were reported in Renewal, Tending and Protection excluding area that was clearcut and scheduled for natural regeneration. A total of 3,914 ha of area harvested using the clearcut silviculture system was scheduled for natural regeneration (i.e. no expenditures for renewal or tending).

The actual amount of site preparation, mechanical (43%) and chemical (37%), was low compared to the amount planned since there is a trend to tree plant in cutovers directly after harvest. Ground chemical site preparation was down because a large portion of allocated pine shelterwood, where this technique is commonly used, was not harvested. Aerial chemical site preparation was down because planting was done immediately following harvest in many cases, so the necessity and window for chemical site preparation was not there. Also, areas scheduled for site preparation and regeneration were generally below target levels outlined by the FMP primarily due to the reduction in harvest levels over the course of the FMP term.

The number of trees planted was 93% of the five-year forecast, excluding the 1,560,000 trees from the Forestry Futures Land Reclamation project.

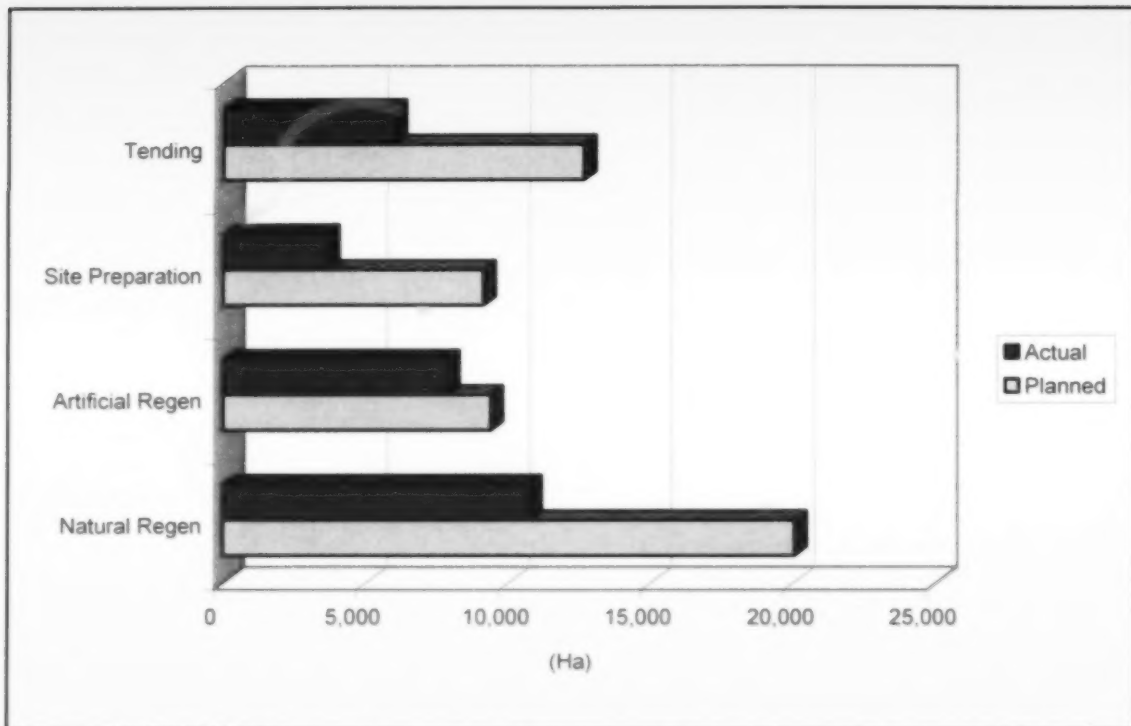


Figure 19. Summary of forecasted versus actual renewal tending and protection for the 2000-2005 term.
Source: Year Ten Annual Report (2005).

The area forecasted to be assessed for FTG in the 2000-2005 FMP was 27,515 ha. The 2001-2002 AR reported that no regeneration assessments were done. The 2002-2003 AR reported that 12,345 ha of FTG was assessed. The text described that much of the back log FTG was caught up by VFM. It was also reported that over 5,000 ha of this area was older barren and scattered or mistyped older stands which were then re-entered into the inventory. The 2002-2003 and the 2003-2004 AR were an inaccurate representation of the actual FTG survey work done since they included FRI update information.

VFM made corrections to the actual FTG area assessed, area successfully regenerated and area not successfully regenerated in the Year Ten AR. When considering that 50% of the planned harvest was actually cut, the true target for assessments was 13,758 ha for the 2000-2005 period. The assessment results showed that 67% of the target area was assessed and, of the area assessed, 95% was FTG.

A discussion about the expenditures and revenues was included in the report. As of March 31, 2005, the Renewal Trust account balance was \$2,245,730 which was approximately \$800,000 above the required minimum balance of \$1,440,100.

The Year Ten AR cited changes that will affect the future effectiveness of the silvicultural program stating, "VFM has taken steps to increase the robustness of its silviculture data and effectiveness monitoring with the development of new survey techniques, along with a new technical system for data collection, compilation and analysis. New ways of approaching data collection and management in terms of silviculture effectiveness monitoring on the Sudbury Forest will help achieve new levels of treatment analysis." Evidence of this was seen by the audit team.

The Year Ten AR did not include a summary statement of silvicultural effectiveness by forest unit, and silvicultural treatment package. The report stated that "...ascertaining the relative success of applying the treatment packages

described in Silviculture Ground Rules (SGRs) was not possible with the data collected. Determining SGRs on sites that were harvested and treated prior to the 2000-2005 FMP proved to be an ongoing challenge for surveyors. The "Actual SGR" portion of the silviculture survey was not consistently determined and the data is hence unreliable. A consistent methodology for determining the SGR/STP on a given site (based on the suite provided in the 2005-2025 FMP) has now been clarified and is currently being employed."

A comparison of projected, actual and desired future forest condition was summarized in the Year Ten AR. According to the report, it was not possible to compare planning terms as forest units have been adjusted as part of a provincial standardization effort in Ontario. Direct comparison was impossible due to newly developed queries allocating forested area into new categories.

The Year Ten AR included a summary of managed forest area available for timber production in Table RPFO-14. The report stated that meaningful results were difficult to extract from the provided information, since the purpose of this table is to analyze multiple planning terms over a longer period of time. What could be seen in the table however, is a loss in area available for timber production. This table showed that the selected course of action for the FMP would reduce the available forest area from 398,168 ha to 379,011 ha. This decrease was rationalized by accumulating reserves, roads and landings, and is typical of other forests being managed in Ontario.

3.7 Achievement of Management Objectives and Forest Sustainability

3.7.1 Achievement of Management Objectives

Management objectives are developed for all Crown forests and, as such, must be consistent with the primary goal of forest management on Crown lands, which is to achieve a healthy, sustainable forest ecosystem, and derive the associated environmental, social and economic benefits as defined by the CFSA. At the individual forest level, management objectives are the desired outcomes of forest management planning achieved through the management of forest cover. The assessment of the achievement of management objectives is, therefore, a critical part of the review of the success of forest management. It also plays an important role in the process of adaptive forest management by allowing adjustments in objectives, targets and strategies over time to reflect successes, failures and the inclusion of new information and approaches to forest management. The audit team reviewed the objectives of the 2000-2005 FMP and provides an assessment of their achievement in Table 4.

Table 4. Review of the assessment of achievement of management objectives in the 2000-2005 Sudbury Forest FMP.

Objective	Audit Team Assessment of Progress Toward Achievement	Comment
Forest Diversity		
Maintain a range of age classes over time for the entire forested landbase in all forest units.	Yes	FMP documents direction consistent with objective.
Within 100 years, create a distribution of forest units more similar to that at the time of pre-logging and pre-fire suppression.	Yes	FMP documents direction consistent with objective.
Maintain an amount of old growth in all forest units over the entire forested landbase.	Yes	FMP documents direction consistent with objective.
Ensure that the hemlock working group on all Crown land continues to have area growing into the older age classes (>120 years old).	No	Hemlock Looper has damaged a significant portion of hemlock stands of all ages on the Sudbury Forest. Recommendation 9 is provided to address this matter.
Maintain the Forest Diversity Indices for forest units and age classes within the bounds of sustainability.	Yes	FMP documents direction consistent with objective.
Emulate natural wildfire disturbance patterns within the Sudbury Forest.	Partial	Only one clear cut size class (131-260 ha) is showing movement towards a more natural frequency by size class.
Social and Economic		
Produce a maximum sustainable supply of fibre for the wood-using industries supplied by the Sudbury Forest on the available land base.	Yes	FMP provides fibre supply within regulated constraints.
Maintain the current economic contribution of the Sudbury Forest to the local economy.	Yes	FMP documents good desired levels of achievement.
Support efforts by the Municipality of French River to compensate for local jobs lost when Tembec's mill in Alban burned.	Yes	FMP documents direction consistent with objective.
Provide economic opportunities for First Nations members who live within or adjacent to the Sudbury Forest.	Yes	Numerous examples of VFMs efforts were found e.g. N'Swakamok
Mitigate the impact of forest operations on First Nations' traditional uses of the Forest.	Yes	VFM has good working relationship with First Nations. Staff meet with First Nations to discuss proposed forestry operations.
Protect cultural and spiritual values in the Sudbury Forest that are identified in the values mapping system.	Yes	AOC protection provided in FMP and found to be implemented during field inspections.
Mitigate the impact of forest operations on recreation areas that are identified on the values map.	Yes	AOC protection provided. Meetings held with cottage groups to address concerns where possible.

Table 4. continued.

Objective	Audit Team Assessment of Progress Toward Achievement	Comment
Values Dependant on Forest Cover		
Maintain preferred wildlife habitat for selected species within the bounds of sustainability.	Yes	
Provide for habitat for species which benefit from shoreline disturbance, such as beaver and mink.	Yes	
Protect fisheries habitat in the Sudbury Forest.	Yes	AOC protection provided as noted in the FMP.
Preserve the integrity of the Sudbury Forest for resource-based tourism at the operational level.	Yes	AOC protection provided. RSAs negotiated during the plan term. Some issues remain with road closure effectiveness.
Silviculture		
Deliver an effective silviculture program which will result in a continuous yield of forest crops of the species, quantity, and quality required by the wood-using industries for which the Sudbury Forest is a source of supply.	Yes	Silviculture program performed well with noted exceptions.
Increase the amount of higher value timber species and products, such as white pine and red pine sawlogs.	Yes	Efforts undertaken at a more limited scale than planned.

The objectives of the 2005-2010 FMP were also examined and an assessment of their achievement is provided in Table 5. These assessments rely on limited information since only one complete year of planned activities had occurred on the Sudbury Forest at the time of the audit. The evidence used to support the assessments was drawn from both the FMP and field stops where activities had occurred between April 1, 2005 and March 31, 2006.

All of the objectives are described as either having been met (Met) or on target to be met, since evidence of progress had been observed by the audit team (On Target).

Table 5. Review of the progress towards achievement of management objectives in the 2005-2010 Sudbury Forest FMP.

Objective	Audit Team Assessment of Progress Toward Achievement	Comment
Forest Diversity		
Move towards a species composition more similar to that estimated at the time of pre-European settlement while maintaining an appropriate supply of high-quality wood fibre from a variety of tree species.	Met	Based on the analysis in Section 15: Comparison of Harvest, Renewal and Tending Forecasts to the Selected Management Alternative.
Move towards a forest with a more even amount of area in each age class.	Met	Based on the analysis in Section 15: Comparison of Harvest, Renewal and Tending Forecasts to the Selected Management Alternative.
Increase the amount of old growth areas that occur in larger patch sizes.	On Target	No specific targets were identified for this objective because spatial modelling tools were not available at the time of plan preparation; however the strategy to select old growth areas adjacent to other existing old growth areas will permit movement towards this objective in the short term.
Retain old growth features in stands when conducting harvesting operations.	On Target	The strategies identified (reduction of stand and site damage, retention of structural diversity, application of NDPEG, location of reserves / bypass and other residual areas containing old growth, etc.) will, if applied consistently through the term of this FMP, permit retention of old growth features in stands being harvested.
Conserve the genetic diversity of white pine populations on the Sudbury Forest.	On Target	Application of the strategies noted in the FMP (identification of isolated stands and the application of the direction in the Silvicultural Guide for the Great Lakes – St. Lawrence Forest) will, if applied consistently through the term of this FMP, permit the conservation of genetic diversity of white pine populations on the Sudbury Forest.
Social and Economic		
Provide a sustainable, continuous and predictable wood supply from the forest that will meet, as closely as possible and for as long as possible, the current recognized industrial demand of the forest.	Met	FMP forecasts consistent with objectives. However, markets for wood products have fallen, thereby not permitting utilization of allowable harvest levels. VFM is doing its part to meet this objective.
Involve Aboriginal Communities in forest management and provide benefit through educational and employment opportunities and new business relationships.	Met	Four of the five First Nations on the Forest have representative on the planning team. Have Memorandum of Understanding with N'Skwakamok Forestry Corporation for harvesting rights, silviculture opportunities, planning and training opportunities and payment for use of traditional knowledge.
Mitigate the impact of forest operations on identified Aboriginal traditional uses of the forest.	Met	Proposed allocations were reviewed by First Nations.

Table 5. continued.

Objective	Audit Team Assessment of Progress Toward Achievement	Comment
Social and Economic (cont.)		
Respect the presence of resource-based tourism businesses on the Sudbury Forest.	Met	RSAs (14) developed with all interested tourist operators.
Respect the presence of other commercial businesses on the Sudbury Forest.	On Target	AOC prescriptions developed as part of FMP and businesses notified about FMP and AWS process.
Protect cultural and spiritual values in the Sudbury Forest that are identified in the values mapping system.	On Target	FMP includes protection measures in the form of AOCs.
Minimize the potential impact of forest operations on recreation areas that are identified on the values map.	On Target	AOC prescriptions (including a developed cottage lakes prescription) were developed in the planning process and implemented.
Values Dependant on Forest Cover		
Maintain habitat and protect critical sites for any species at risk known to occur on the Sudbury Forest.	Met	FMP-17 shows prescriptions for species at risk (e.g. wood turtle, bald eagle, red shouldered hawk).
Conduct required fish and wildlife surveys in support of the 2005 Forest Management Plan.	Met	Accomplished in preparation for planning for the 2005-2010 FMP.
Provide the necessary spatial distribution of habitat for moose, marten and pileated woodpecker.	Met	Planning shows progress towards objective (e.g spatial analysis of current moose, marten and pileated woodpecker habitat).
Provide for habitat for species that benefit from shoreline disturbance, such as beaver and mink.	On Target	Prescription is developed; if trappers ask for it to be applied, objective can be achieved.
Protect water quality and fish habitat within watercourses and waterbodies affected by forest management.	On Target	The audit team saw good evidence both in the planning of the 2005-2010 FMP and in the field inspection of water quality/fish habitat related AOC's prescriptions that this objective is on the right track for achievement.
Silviculture		
Continue to develop and implement an effective Silviculture Effectiveness Monitoring (SEM) program.	On Target	Field testing of SEM was started in the first year of the five-year term (2005). Progress was made in the implementation of SEM program in the second year and is continuing.
Conduct enhanced forest management activities on the Sudbury Forest.	On Target	Much work completed in 2005. Field surveys started, completed all 2005 eligible pre-commercial red pine thinning, work to continue during remainder of FMP.

3.7.2 Review of RPFO Assessment of Sustainability

The Year Ten AR was prepared for the Sudbury Forest for 2004-2005. The report provided an assessment of sustainability as well as a review of the achievement of management objectives as specified in the 2000-2005 FMP. All reporting requirements were met. Discussion included change to the Sudbury Forest landbase and the overall underutilization of the available harvest as concerns, with a number of reasons provided for low utilization rates. Low harvest utilization resulted in reduced renewal effort without affecting sustainability of the Sudbury

Forest. While the report concluded that the Forest is being managed sustainably, continued underutilization was presented as a concern.

3.7.3 Review of the Comparison and Trend Analysis of Planned Versus Actual Forest Operations

Appendix C of the 2006 IFAPP requires the auditee to prepare a Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report (TAR) to provide an overview of changes to a management unit over time and a comparison of planned versus actual forestry activities across several planning terms. For the Sudbury Forest, the TAR was prepared by VFM and spanned the period from 1990 to 2005, covering three planning terms.

Numerous changes to the management unit landbase have occurred during the period of the TAR and the document itself is an assembly of information from a number of management units. This includes the 1990-1995 Timber Management Plans (TMPs) for the Killarney, Trout Lake and Wanapitie Crown Management Units (CMUs), the 1995-2000 TMP for the Sudbury Forest (Killarney, Trout Lake and Wanapitie CMUs were amalgamated in 1994 to form the Sudbury Forest) and the 2000-2005 FMP for the Sudbury Forest as prepared by VFM.

From 1990 through 2005 the total production forest decreased from 451,404 ha in 1990 to 396,168 ha in 2000, and increased again to 447,855 ha in 2005 with the inclusion of a portion of the Spanish Forest. The most significant reductions to the Sudbury Forest landbase were the result of the Ontario Living Legacy Land Use Strategy. Other changes to the landbase were caused by small adjustments to patent lands within the Forest and the development of a new FRI which included improvements in the delineation of non-forested areas (reclassifying as rocky areas to Non-Productive from the Protection Forest area).

In 1990, the area of Barren and Scattered (B&S) and Not Satisfactorily Regenerated (NSR) forest land was 93,350 ha (20.7% of the total landbase). This decreased to 36,432 ha (8.9% of the total landbase) in 2005 (4,964 ha B&S/NSR and 31,468 ha Depleted).

Due to changes in forest unit definitions, comparison of area by forest unit is not possible across the three planning terms reported in the TAR. Changes in forest units between FMPs have been commonplace in Ontario, making landbase tracking over time difficult. Recently, attempts to standardize forest units should serve to alleviate this problem in the future.

For the Sudbury Forest, the forest units used in the 2000-2005 FMP were based largely on Forest Ecosystem Classification (FEC) types in combination with species composition and were developed with the assistance of the South Central Science and Technology Unit of the MNR. Forest units for the TMPs of 1990-1995 and 1995-2000 were based primarily on working groups. The number of forest units for each planning term are as follows: 1990-1995 – eight forest units (combination of all three TMPs); 1995-2000 – ten forest units; and 2000-2005 – ten forest units. The 2005-2010 FMP has 16 forest units.

Table 6 shows variable levels of utilization of available harvest volumes for all species on the Sudbury Forest. Although actual harvest remains considerably lower than planned, closer examination reveals less variability in those species that are considered more valuable and/or desirable. Table 7 presents a comparison of utilization levels of available harvest for white and red pine (Pw/Pr); jack pine and spruce (Pj/Sp); maple (M); white birch (Bw); and Poplar (Po). Utilization levels of those species that are considered valuable remains consistently high while actual harvest levels of less valuable species remains consistently low. Weak markets for low-grade fibre remains an issue as discussed in more detail in Section 3.6.3 of this report.

Table 6. Actual harvest volume compared to planned harvest volume for all species.

	1990-1995	1995-2000	2000-2005
Planned Harvest (m ³ /yr x 1,000)	309.5	252.4	381.3
Actual Harvest (m ³ /yr x 1,000)	168.8	184.0	234.6
Actual harvest/Planned harvest (%)	54.5	72.9	61.5

Table 7. Actual harvest volumes compared to planned volumes (%).

Species	1990-1995	1995-2000	2000-2005
Pw/Pr	70	93	107
Pj/Sp	72	91	81
M	11	29	41
Bw	14	22	30
Po	37	60	47

With actual harvest levels consistently lower than planned, renewal efforts were also reduced (see Table 8). A variety of silviculture systems were used on the Sudbury Forest including uniform shelterwood cuts, clearcuts, seed tree cuts, selection cuts and CLAAG, so the planned renewal program relied heavily on natural regeneration with 89%, 66% and 73% of the harvested areas regenerated naturally in each of the three terms. Table 8 shows achievement levels for planned regeneration were consistently higher for artificial regeneration than for natural regeneration.

Table 8. Actual regeneration compared to planned regeneration levels.

	Plan Term		
	1990-1995	1995-2000	2000-2005
Natural Regeneration			
Planned Area (ha)	16,120	23,085	22,599
Actual Area (ha)	14,054	4,047	10,489
Percent	87	18	46
Artificial Regeneration			
Planned Area (ha)	3,525	4,100	9,377
Actual Area (ha)	3,811	4,340	7,836
Percent	108	106	84

Renewal achievement directly related to renewal effort and actual harvest levels. Table 9 provides a comparison of actual regeneration levels and actual harvest levels. Although renewal efforts suffered during the 1995-2000 term, efforts were made by VFM to overcome the renewal deficit (5,701 ha from 1990 to 2000 to 2,611 ha from 1990 to 2005).

Table 9. Actual regeneration compared to actual harvest levels.

	Plan Term		
	1990-1995	1995-2000	2000-2005
Actual Harvest Area (ha)	19,075	15,437	14,488
Actual Regeneration Area (ha)	17,865	10,946	17,578
Regeneration Area as a Percent of Harvest Area	94	71	121

3.7.4 Achievement of Forest Sustainability

Prior to implementation of the CFSA, the objective of forest management was to provide timber to the forest industry in a manner consistent with sound environmental practices and to provide for other uses of the forest. With implementation of the CFSA in 1994, recognition was given to the importance of forest sustainability. It should be kept in mind that the means of achieving forest sustainability under the CFSA is through the management of forest cover. According to the CFSA, forest sustainability is defined as *"long term Crown forest health"*. Two key principals are associated with forest sustainability:

- *"Large, healthy, diverse and productive Crown forests and their associated ecological processes and biological diversity should be conserved."*
- *"The long term health and vigour of Crown forests should be provided for by using forest practices that, within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air and social and economic values, including recreational values and heritage values."*

The methods of planning for and assessing the achievement of forest sustainability are described in the FMPM. It begins with an eight-step process that includes gathering background information, setting objectives and developing strategies, identification and analysis of management alternatives, selection of a preferred management alternative, and the identification of specific areas for forest operations. Throughout the process, opportunities are available to the public to participate and provide input into the development of the FMP. The assessment of achievement of forest sustainability involves the analysis of trends associated with a set of criteria and indicators of sustainability, given in the FMPM.

Monitoring of forest sustainability under the 1996 FMPM is scheduled to occur when an FMP is completed and the RPFO compiled. The RPFO would look at a suite of 14 indicators, compare the before and after plan levels (and levels recorded in previous FMPs) and make a determination as to whether the indicators were moving in a positive or negative direction with respect to FMP objectives and forest sustainability.

In developing its opinion on the achievement of forest sustainability on the Sudbury Forest the audit team considered the following:

- e) 2000-2005 and 2005-2010 FMPs;
- f) Annual Work Schedules and Annual Reports associated with the above FMPs;
- g) Conclusions of the 1995-2000 RPFO;
- h) Sudbury Forest Year Ten Annual Report (2004-2005);
- i) Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report;
- j) Input from staff of VFM and MNR Sudbury District and members of the Sudbury LCC;
- k) Written input received from the public;
- l) Implementation and effectiveness of forest management activities viewed on 16 field sites.

Based on the information provided and the audit team's review of documentation and examination of the Forest, it is the opinion of the audit team that forest sustainability is being achieved on the Sudbury Forest, although improvement in some areas is required as described in the various recommendations and suggestions contained in this audit report. Table 10 provides a summary by forest sustainability criteria of the audit team's assessment of forest sustainability.

Table 10. Summary of assessment of forest sustainability.

Forest Sustainability Criteria	Status	Audit Team Comments
Biological Diversity	Met	AOCs used to protect integrity of known biological values; rare, threatened and endangered species considered in FMPs; underutilization of harvest limits ability to recapture historic forest condition.
Forest Condition and Ecological Productivity	Met	Harvest levels are regulated; renewal program is keeping pace with harvest; some stand conversion has occurred.
Soil and Water Quality	Met	Soil and water protected from impacts of forestry activities; riparian AOCs implemented; roads constructed and maintained appropriately; water crossing installations/removals properly done.
Multiple Benefits to Society	Met	The Forest supplies significant financial and social benefits, locally and provincially (e.g. employment, recreation, taxes), including benefits from forest management accruing to Aboriginal peoples; N'Swakomuk participates as a shareholder of VFM and as a licensee on the Forest; problems with lack of markets for lower grades of fibre.
Accepting Society's Responsibility for Sustainable Development	Met	Forest management planning allows for public involvement at all stages including direct representation via the Sudbury LCC and through a variety of opportunities; VFM and MNR staff are responsive to public concerns.

3.8 Contractual Obligations

3.8.1 Contractual Obligations – Vermilion Forest Management Company Limited

The Sudbury Forest SFL was first approved on June 10, 1998 through Order-in-Council No. 1426/98. This licence assigns a number of contractual obligations to VFM. The SFL was most recently amended by Order-in-Council No. 656/2005 dated April 20, 2005. The licence obligations are provided below with a brief synopsis of the audit team's respective findings.

Specified Procedures Audit: The audit team conducted an assessment of 39% of the projects funded under the Renewal Trust Fund for the fiscal year 2004-2005. The assessment determined that the maps, records and field work associated with the Forest Renewal Trust Account expenditures for 2004-2005 were accurate and that the fieldwork was appropriate to the site conditions.

Silviculture standards: At the time of signing the SFL, the company becomes responsible for areas harvested that have not yet met FTG standards. The company must meet silvicultural standards on X and Y lands and must undertake tending on Z lands where needed to bring the areas to FTG status. A summary table showing the amount of X, Y, and Z lands at the time VFM signed the SFL was provided to the audit team.

There were 11,289 ha of X lands, 2,455 ha of Y lands and 18,400 ha of Z lands which required attention by VFM. For X, Y, and Z lands combined, 46% were identified as FTG and 54% were not FTG. These areas were further broken down into a detailed summary that described how much of the area was harvested by clearcut, shelterwood and selection systems and what portion of these are now FTG, require further treatment, or need to be surveyed to update their status. For X lands, 38% is FTG, 26% is under treatment, and 36% requires survey work. For Y lands, 62% is FTG, and 38% is under treatment. For Z lands, 47% is FTG, 4% is under treatment, and 47% requires survey work. All of these areas were recorded digitally in the GIS. Maps were provided to the audit team showing the X, Y, and Z lands with the status of those lands layered on top; namely what is free growing, where partial cutting systems were prescribed and implemented, and areas pending further treatment

and FTG surveys. A field survey was done on a representative sample of the silvicultural activities and was found to be mapped and reported correctly in comparison with the actual work done in the field.

The 2000-2005 FMP forecasted survey levels of 27,515 ha which equalled the forecasted harvest level for that period. Annual reports were examined and it was found that the areas to be assessed as FTG and the results of the surveys were inaccurate as reported in the ARs for 2002-2003 and 2003-2004. VFM reported that assessments were completed for 12,345 ha or 45% of the original forecasted area as FTG survey; however a portion of this survey work was actually FRI updates of stands with origins predating 1989. Corrections were made to the 2004-2005 AR where 9,162 ha were reported as true FTG assessments and of that area, 8,674 ha were successfully regenerated, leaving 489 ha as not successfully regenerated. The harvest level was only 50% of the original forecasted area making the forecasted survey level appear high. When using a revised target assessment level of 13,758 ha (50% of the original forecast 27,515 ha), the result is that approximately 67% of the target area was assessed for FTG and of the assessed survey area, 95% met regeneration standards.

The audit team examined several FTG sites during the field audit. The trees met the FTG standards for height and stocking. These sites were traceable through the cycle of SGRs in the FMP, FOPs, field operations and regeneration assessments surveys. The new FTG stand descriptions were used to update the FRI and were incorporated into the landbase tracking system which VFM has developed. Eligible areas which do not meet FTG standards are tended and/or monitored until they reach FTG status and a survey is repeated.

VFM is very committed to continuing its regeneration and silviculture effectiveness survey program. With the assistance of the Science and Technology Unit of MNR, VFM developed a survey method called FOREcaST to assist them in determining FTG status and the need for remedial work.

Payment of forest charges: A review of MNR statements for the status of Ontario Crown Charges and Forestry Future Charges found the VFM account to be satisfactory.

Wood supply commitments and overlapping licences: There were no wood supply commitments contained in Appendix E of the SFL.

Planning, reporting, information supply and utilization requirements: The FMP and associated AWSs and ARs were prepared in accordance with the 1996 FMPM and 2004 FMPM as described in this report. Exceptions to planning requirements were noted during the audit and are addressed with eight recommendations and five suggestions.

Salvage harvesting: No salvage operations occurred or were planned on the Sudbury Forest during the period under audit. The FMP contained no reference to natural disturbances as being eligible for forest management activities. While minor in magnitude, the inclusion of natural disturbances being eligible for salvage harvesting or subsequent renewal activities should be considered for the next FMP.

Forest protection: A pest management program was not planned or implemented during the audit period. Natural Resources Canada conducts insect surveys and provides yearly updates on insect pest populations and damage to VFM.

Performance reviews: An independent forest audit was conducted in 2001 covering the term 1996-2001. An audit report was produced and an audit action plan was developed by VFM and MNR to address the audit recommendations. Section 3.8.2 discusses this topic in detail.

Forest Renewal Trust Account: The required minimum balance in the Forest Renewal Trust Account was \$1,304,600. The minimum balance was exceeded at the end of each fiscal year (March 31). The excess amounts were \$34,600, \$40,917, \$844,855, \$812,396, and \$844,488 for the March 31 year ends of 2001 through 2005 respectively.

Withdrawals: Appendix G of the SFL – Summary of Sustainable Forest Licence Amendments – outlines four withdrawals from the licence area. All withdrawals were associated with the Ontario Living Legacy Land Use Strategy.

Aboriginal opportunities: VFM supported the development of N'Swakamok Forestry Corporation, a company jointly owned by five First Nations. N'Swakamok holds an overlapping licence on the Forest and is a shareholder of VFM. VFM further supports Aboriginal entrepreneurs through the provision of silviculture opportunities.

Compliance planning and monitoring: VFM is responsible for compliance planning for all operations on the Sudbury Forest. The 2000-2005 FMP included compliance planning as part of the Monitoring and Assessment section while the 2005-2010 FMP included a comprehensive compliance strategy and plan as Appendix VII. Compliance monitoring was performed with delays in reporting. Concerns related to utilization at the stand level (noted during the last audit) have been addressed as evidenced by the compliance reports and observations made during the field audits.

Operations on mining claims: Operations on mining claims are very common on the Sudbury Forest but rarely an issue. Claim holders receive a notice of planned activities at the AWS stage so that they may meet with loggers to locate boundaries and discuss concerns. The audit team could find no evidence of issues and/or instances of non-compliance related to forestry activities on any mining lease or claim.

Special Conditions: Appendix F of the SFL agreement provides Special Conditions, through memoranda of agreement, which list opportunities for operators to conduct harvesting activities on the Sudbury Forest in accordance with the FMP. Table 11 provides a list of those operators contained in Appendix F of the SFL, their FMP harvest allocations and the harvesting rights provided.

Table 11. Comparison of FMP harvest allocations and harvesting rights from Appendix F of the SFL

Independent Operators	Harvest Rights (%)	FMP Allocations (%)
Rastal Mine & Supply	0.45	0.45
Tupnikaning Enterprises	1.18	1.17
Lakeland Lodge	0.09	0.08
Dan Hebert Logging & Clearing	0.45	0.46
NSwakamok Forestry Corporation	17.20	8.00

All of the shareholders and independent operators were contacted directly. Of those who responded, all were satisfied with the performance of VFM in terms of their efforts to balance harvest rights, allocations and wood flow. Harvest rights were being met and discussions and arrangements made through VFM appear to have been consistently fair and open.

3.8.2 Actions Associated with the 2001 Independent Forest Audit

A total of 17 recommendations (including licence extension) were made in the 2001 IFA report. In conducting its review of the actions developed to address the recommendations, the audit team assessed whether planned actions were consistent with the intent of the original recommendation, appropriate to address the recommendation, that the actions taken were those described in the approved action plan, and that the actions taken were effective. Table 12 indicates the status of the recommendations from the 2001 IFA, in the audit team's opinion.

Table 12. Assessment of achievement of the 2001 IFA recommendations.

	Recommendations from the 2001 Sudbury Forest IFA	Summary	Completed
1	The MNR, in consultation with the LCC, should identify educational needs, and the means to deliver them, in anticipation of the next forest management planning cycle.	A number of initiatives undertaken to address this Recommendation.	Yes
2	The Planning Team assembled for development of the 2005 FMP should contain all the required expertise as described in the FMPM.	Planning team assembled by October 2002 and included representatives from Parks Ontario, MNR Fire Management, MNR Northeast Region and MNR Science and Technology Development Unit	Yes
3	Corporate MNR should modify the forest management planning process to encourage evaluation of meaningful management alternatives.	New FMPM completed. 2005-2010 FMP prepared under 1996 FMPM so Action Plan looked at meaningfully addressing recommendation was not possible. Thoughtful reasoning is provided in the Status Report to support this direction.	Yes
4	VFM and MNR should develop a comprehensive Old Growth management strategy for the Sudbury Forest.	Old Growth Strategy was prepared and incorporated into the draft submission of the 2005-2010 FMP.	Yes
5	The MNR should commit to conducting fish and wildlife surveys in support of forest management in the Terms of Reference for the 2005 FMP and by including a strategy and objectives for fish and wildlife surveys in the 2005 FMP.	Surveys conducted in 2003 and 2004. Updated thermal coding entered into NRVIS available for FMP.	Partial Fish and wildlife surveys were conducted in preparation for the 2005-2010 FMP but no strategies or objectives were included in the FMP (see Recommendation 5)
6	The MNR should conduct appropriate fish and wildlife surveys and inventories throughout the implementation of the 2000 FMP.	Correct moose aquatic feeding area information was seen as critical and to this end MNR, with help from VFM, conducted a comprehensive survey of the remaining three years of harvest blocks in the 2000-2005 FMP.	Yes
7	VFM and the MNR should develop a strategy for the management of low-quality hardwoods in conjunction with the strategy to be developed for the Nipissing Forest, for inclusion in the 2005 FMP.	It was decided that this recommendation is no longer required as markets had improved.	Yes

Table 12. continued

	Recommendations from the 2001 Sudbury Forest IFA	Summary	Completed
8	The MNR and VFM should continue to implement fuelwood areas in future plans and the MNR should develop improved communication to inform the public of fuelwood cutting opportunities and practices.	Since markets for white birch and dense hardwood pulp had improved, this recommendation was no longer considered important. Fuelwood areas were however, included in draft plan submission..	Yes
9	VFM should ensure that the access strategy in the 2005 FMP includes full consideration of tertiary roads and the roles they play in the Sudbury Forest.	Tertiary access road corridors to allocations were identified and shown at the last two Information Centres and were included in the 2005-2010 FMP.	Yes
10	Corporate MNR should revise the access road planning and reporting requirements to recognize the role and nature of tertiary roads in the GLSL forest.	The provincial <i>Forest Roads and Water Crossings Initiative</i> was undertaken to review the current approach to policy and planning for forest access roads and made recommendations for modification and improvement as warranted.	Yes
11	VFM should continue to work with operators to provide education and training on compliance related topics, and to ensure that operations are appropriately supervised.	VFM staff obtained certification. Compliance/training meetings held with operators. MNR attending VFM's annual training sessions. Work is ongoing.	Yes
12	VFM and the MNR should give special attention to monitoring the compliance of Goulard Lumber (1971) to ensure that this company adheres to required performance standards and the terms of its Forest Resource Licenses.	VFM completed a number of initiatives to address this recommendation. Goulard has a certified compliance inspector on staff now. The 2006 IFA auditors saw evidence of significant improvement on Goulard's operations.	Yes
13	The MNR should review its staff complement and staff roles to ensure that it has adequate capacity to fulfill its forest management responsibilities.	MNR completed several tasks to address this recommendation including a review of staffing complement, staff training and work assignments.	Yes
14	VFM should accelerate the Free-To-Grow survey program for the Sudbury Forest to ensure that the 2000-2005 FMP objectives will be met. These results should be used, where appropriate, in the preparation of the 2005-2010 FMP.	Strategy was developed and implemented to address this recommendation.	In progress
15	MNR should work with VFM to develop mechanisms to provide VFM with information on the amount of money that is outstanding to the Forest Renewal Trust in accounts receivable, to assist VFM and the Licensees in tracking their stumpage payments.	MNR and VFM worked together to implement a system whereby VFM is aware of the status of individual Overlapping Licensees. All concerns with respect to Freedom of Information Act were addressed.	Yes
16	The MNR should ensure that adequately detailed information on transactions related to the Forest Renewal Trust are provided to Royal Trust, and that this information is reflected in the monthly statements provided to VFM.	Issues associated with tracking the Renewal Trust Account have been resolved by MNR in cooperation with VFM.	Yes
17	The audit team recommends extension of the Licence for a further five year period.		Yes

4.0 Summary of Conclusions and Recommendations

This section provides a summary of conclusions and recommendations of the 2001-2006 Independent Forest Audit of the Sudbury Forest. Table 13 provides a summary, by responsible party, of the number of recommendations, suggestions and best practices identified during the audit. A complete list is given in Table 14.

Table 13. Summary of recommendations, suggestions and best practices by responsible party.

	VFM	MNR	VFM and MNR	VFM, MNR, & LCC	Total
Recommendations	9	8	3	-	20
Suggestions	6	4	2	-	12
Best Practices	1	-	-	1	2

Commitment

MNR and VFM have policy statements outlining their commitment to sustainable forest management. Both VFM and MNR demonstrated a commitment to adhere to the rules and regulations governing forest management activities.

Public Participation

Although the planning process was generally completed as required, the audit team found exceptions to the planning process. These have been addressed with two Recommendations and two Suggestions.

The Sudbury LCC was formed prior to the development of the 2000-2005 FMP and was active during the development and implementation of the 2000-2005 FMP, and the 2005-2010 FMP. The LCC effectively represented a balance of interest including First Nations and businesses, anglers and hunters, the tourism industry, naturalists, municipalities, loggers and cottagers. LCC meetings were open and effective.

Five First Nations are considered within or adjacent to the Sudbury Forest as follows: Dokis; Henvey Inlet; Wanapitei; Whitefish Lake; and Wikwemikong. Point Grondine Indian Reserve #3, a landbase of Wikwemikong, is also located within the Sudbury Forest. Temagami First Nation also has traditional land use areas in the Sudbury Forest. First Nations participation in the planning process was exemplary.

Forest Management Planning

The planning team for the 2005-2010 FMP was established as required with appropriate composition. A member of the Sudbury LCC was a member of the planning team. The planning team followed FMPM direction.

Public correspondence during FMP development was recorded and responses to requests for information and to queries were appropriate and timely, including meetings and presentations when necessary.

During the planning process for the 2005-2010 FMP, VFM contacted 84 resource-based tourism businesses with an invitation to enter into RSA negotiations. VFM met with approximately 30 operators and RSAs were developed with 14. The FMP contained the required statement of commitment to maintain the viability of the tourism industry by protecting tourism values in the FMP process through the application of the Tourism Guidelines and the use of RSAs.

The 2005-2010 FMP included a thorough description of the management unit with all of the necessary information to link the forest condition with objectives, historic forest condition and SGRs.

An aging FRI was of concern to the audit team. The FRI was based on 1990 FRI, updated as required for the development of this FMP. The same FRI, with required updates, was used for the 1995-2000 and 2000-2005 FMPs and is scheduled for use in the development of the ten-year 2010-2020 FMP. At the end of the 2010-2020 FMP term, the FRI will be 30+ years old. The audit team makes a recommendation to address this weakness.

The audit team noted that seven wildlife species on the Sudbury Forest were projected to experience 30-36% habitat declines in seasonal or year-round habitat under the selected management alternative once the desired future forest condition is reached. The audit team feels that ecoregional analysis of wildlife habitat status for the 22 regionally selected species is needed to provide context for the habitat conditions for these seven species on the Sudbury Forest, and provided a recommendation to this effect.

The range of management alternatives identified in the FMP addressed FMPM requirements and satisfied the planning team and the LCC. An additional alternative, later selected for implementation, was investigated that provided more balanced consideration for all objectives. All management alternatives were compared to a natural benchmark scenario that represented how the Forest was expected to develop over time in the absence of human intervention (i.e. no harvesting, no renewal treatments, no fire suppression). A reasonable and comprehensive set of objectives and targets were determined for the FMP, varied for each management alternative and logically incorporated into the SFMM modelling. Strategies relevant to the management unit were stated for each objective.

The SFMM modelling for the 2005-2010 FMP was well structured and inputs generally utilized the best available information at the time of FMP preparation. Instances where SFMM modelling might be improved were noted as suggestions.

Operational planning forms a component of forest management planning, specifically directed at those areas selected for forest management activities during the implementation of the FMP. The audit team examined AOC prescriptions and the associated values information, silviculture, access and harvest. Values information collection had been pursued as recommended in the last IFA. However, the audit team found evidence that further efforts are needed and makes a recommendation to address this.

Silviculture planning was consistent with FMPM requirements. The STP included a silvicultural system, with a range of acceptable harvest, site preparation, regeneration, and tending methods. The STP believed to be the most efficient and effective in achieving the standards specified in the SGR for a given forest unit and site type was prescribed. Within the SGRs, the preferred STP was identified and the remaining STPs for that SGR were ranked in order based on expected frequency of use. An exception was provided with the required associated monitoring strategy. An inconsistency between planned and applied SGRs resulted in a recommendation.

Access planning was found to match FMP objectives and strategies. Recurring conflicts over road use were addressed with a suggestion to MNR. The audit team saw a potential problem for VFM with the road use strategies not being carried through from one FMP to the next. Since Sudbury District MNR keeps a road strategy binder which ensures the road use strategy stays associated with a developing or developed road from FMP to FMP the audit team suggests MNR provide a maintained copy of this binder to VFM.

The audit team found that the areas selected for harvest, renewal and tending operations were consistent with the defined eligibility criteria. The total allocation by forest unit was consistent with the AHA, however the allocation according to age class varied from the SMAs for several forest units. Although the required SFMM analysis demonstrated that planned operations were consistent with the SMA – the amount and degree of age-class substitution did not jeopardize the achievement of FMP objectives or sustainability – the planning team has recognized age class substitution as a concern for the next FMP. The audit team provides a recommendation to ensure that this intention is included in the 2010-2020 FMP.

A recommendation is provided to address identification of an appropriate level of contingency area in the 2010-2020 FMP.

During the period of the audit, 100 amendments to the FMP occurred. Four of these were minor requiring public notice and two were withdrawn or rejected. A review of the administrative amendments indicated internal review and approval of amendments were generally within an acceptable time frame. The number of amendments is relatively high, but reasonable. A recommendation is provided to address tracking of amendments since a number were found to be duplicated or missing in MNR's electronic filing system.

AWSs were found to be completed according to requirements. A Best Practice was given to VFM for appending tabular summaries of block by block compliance inspection reports to Annual Plans of Action included in the AWS.

Plan Implementation

The audit team inspected a self-selected sample of field sites as part of the audit. At these sites the audit team examined, where appropriate, AOC prescriptions, access development including water crossing installations, road construction and maintenance; harvest operations and silviculture. The audit team observed that prescriptions were carried out as planned or modifications were covered by an amendment or compliance report detailing the difference from the planned prescription. Where AOC non-compliance was noted, they were usually minor in nature. The audit team saw one example where winter skidding had occurred along a known stream resulting in a repair order that was successfully carried out by the contractor.

All harvest areas chosen for inspection were approved in the FMP, consistent with the SGRs and approved as well in the AWS. VFM has an effective slash management program on most areas, but the audit team did note examples of skidways where tops were piled rather than burned, resulting in the loss of productive area for silvicultural treatment. Although VFM staff expressed concern related to the proximity of several of these sites to highways and/or homes, we suggest that VFM explore slash management opportunities including low complexity burns in these areas.

Where deviations from approved operations occurred, amendments to the FMP, FOP as well as AWS revisions were made. Operations were consistent with site conditions. Operations on the Sudbury Forest were generally conducted in such a way that site disturbance was minimized.

VFM was diligent in dealing with instances of poor utilization within harvest blocks. The audit team noted only one case of poor log making leading to an unreported utilization problem at a landing. Heavy snow at the end of the operating season had buried much of this material, making a thorough final inspection difficult. Overall, utilization within the harvest blocks on the Sudbury Forest was acceptable.

Harvest operations were generally in compliance with approved operations. Specific non-compliances have occurred, and serious cases (e.g. dealing with excessive site damage, trespasses into AOCs, harvesting without approval, cutting unmarked trees or damage to regeneration) resulted in compliance orders or penalties.

Renewal activities and SGRs were approved in the FMP and the AWSs except one case where red spruce was planted and not included in the SGRs or AWS. A recommendation regarding this situation was provided. Renewal activities were consistent with the FOPs and were generally appropriate and effective for the specific site conditions. The renewal activities were consistent with information reported in the ARs. The achieved levels of renewal activities appear low when compared to the planned levels. This is primarily due to only 50% of the available harvest area in the 2000-2005 FMP actually having been harvested and limits the usefulness of a comparison.

One problem area was examined where jewelweed (or touch-me-not) had become established and the newly planted small white pine seedlings were well overtopped by these dense plants. A suggestion and a recommendation are provided to address the problem.

One compliance issue was found regarding a fall tree plant. The Company inspector found the inspection to be not in compliance, and the MNR spot check found the status to be not in compliance with comments. Since the contractor was new to tree planting and required more supervision, a recommendation is given.

Tending and protection activities included manual tending, ground and aerial herbicide spraying, and red pine pre-commercial thinning, and were consistent with the FMP including the SGRs and the FOPs, and were approved in the AWS. Tending activities were also appropriate for the specific site conditions and consistent with information in the ARs.

The audit team inspected a selection of access activities for primary, secondary and tertiary roads (road construction, road decommissioning, road maintenance, various types of water crossings (i.e. winter, normal culverts, "box" culverts and portable bridges). All road building activities were as planned or were covered by an FMP amendment.

Water crossings were generally well done, including decommissioning. Where roads were planned to be decommissioned, one contractor used "box" culverts which consisted of two sill logs or timbers bridged by squared timbers and covered with gravel. These structures presented similar advantages to miniature portable bridges in that stream bed disturbance during installation or removal of the structure was not required. Portable bridges from small "skid" bridges used on tertiary roads or skid trails to large bridges across rivers were used to good effect on the Forest. Many of the decommissioned roads the audit team examined had had portable bridges or "box" culverts removed.

The audit team visited one winter-only operation in an area with fine textured soils. Although water crossings were well done, erosion of the road surface had occurred where the sloped approaches to the crossing were moderate to steep. A recommendation was given to ensure that water bars are used where there are moderate to steep slopes on approaches to water crossings.

Several Category 9 and 14 aggregate pits were examined for compliance with the Aggregates Resources Act. A number of problems were encountered including no boundary marking, no overburden removal and storage, steep pit slopes and excavation below the ditch line. A recommendation is provided to address the types of problems that were encountered.

Effective access control is an issue on the Sudbury Forest as it is on many forests where there are conflicting interests for resource use. The audit team views this problem as requiring a proactive approach and suggests that VFM and MNR work together to ensure effective strategies are employed to restrict vehicular access where that is the management use strategy.

Systems Support

Employees must be well trained to ensure they are aware of current, relevant legislation, industry and government regulatory requirements and standards, and the organization's policies and objectives. Interaction with VFM and MNR employees during the site visit indicated that adequate training opportunities were made available to staff.

Monitoring

Compliance monitoring of forestry activities is a joint responsibility of the forest industry and MNR. The actual level of the overall monitoring program was appropriate. Non-compliant activities were recorded and dealt with during the normal monitoring program. All of the harvest blocks included in the field audit had at least one, and usually several, compliance inspection reports completed and on file. There was a disconnect between the number of monitoring inspections scheduled in the Annual Plans of Action and the number of reports actually submitted. Both the Company and MNR sometimes pooled inspections, often completing two or three inspections before submitting a final report. The audit team makes a recommendation to deal with reporting timelines that were not consistently met.

VFM carried out plantation performance assessments to determine height and survival of new plantations. This information along, with visual inspections, was used to determine the need for planting refill and/or competition control. The audit team makes a recommendation that VFM must ensure that FTG surveys are completed.

Problems with annual reporting were addressed with two recommendations dealing with timelines and phase-in requirements of the 2004 FMPM.

The audit team reviewed the Year Ten AR which was prepared in place of the former RPFO as required by the 2004 FMPM. Although it was late (with reason) it was generally well done. One suggestion and two recommendations were presented to deal with its shortfalls.

Achievement of Management Objectives and Forest Sustainability

The audit team viewed VFM's achievement of management objectives. All objectives were met except two which were partially met. The review of the TAR describes the problems associated with analyzing trends over longer periods of time in the face of changing analysis standards. In the case of the Sudbury Forest:

- Data from three former CMUs were used for the first five-year period of the TAR;
- Numerous adjustments to the landbase occurred seeing the total production forest decrease from 451,404 ha in 1990 to 396,168 ha in 2000 and increase again to 447,855 ha in 2005 with the inclusion of a portion of the Spanish Forest; and
- Changes to the definition and number of forest units occurred.

With actual harvest levels consistently lower than planned over the 15-year period of the TAR, renewal efforts were also reduced. The planned renewal program relied heavily on natural regeneration in each of the three terms. Achievement levels for planned regeneration were consistently higher for artificial regeneration than for natural regeneration. A substantial renewal shortfall occurred in the 1995-2000 term with efforts made in the 2000-2005 term to reduce this shortfall. Plans are for this effort to continue in the 2005-2010 FMP where regeneration levels are 5,735 ha more than harvest levels for the five-year term.

Contractual Obligations

The audit team reviewed the SFL to determine the degree to which contractual obligations were met. Comment is provided on each of the obligations which include Specified Procedures Audit, Silviculture standards, Payment of forest charges, Wood supply commitments and overlapping licences, Planning, reporting, information supply and utilization requirements, Salvage harvesting, Forest protection, Performance reviews, Forest Renewal Trust Account, Withdrawals, Aboriginal opportunities, Compliance planning and monitoring, Operations on mining claims and Special Conditions.

Conclusion

The audit team concludes that, with the exceptions noted in the audit report, management of the Sudbury Forest was in compliance with legislation, regulations and policies and was effective during the term of the audit. The Sudbury Forest was also managed in compliance with the terms of Sustainable Forest Licence No. 542442 held by VFM. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

Recommendation 20: Based on the outcome of this audit and performance with respect to its contractual obligations, the audit team recommends the Minister extend the term of the VFM Sustainable Forest Licence to March 31, 2028.

Table 14. Summary of recommendations, suggestions and best practices.

Principle 1: Commitment
None
Principle 2: Public Participation
<p>Recommendations:</p> <ol style="list-style-type: none"> 1: MNR must ensure that notices meet FMPM requirements. 2: MNR must retain records of all notices to all Aboriginal communities demonstrating that FMPM requirements were met. <p>Suggestions:</p> <ol style="list-style-type: none"> 1: MNR and VFM should ensure that all notices include appropriate instructions for response. 2: VFM should ensure that all public notices meet the requirements of the FMPM. <p>Best Practice:</p> <ol style="list-style-type: none"> 1: VFM, MNR and the Sudbury LCC are commended for employing innovative tools and exemplary effort in engaging the public, stakeholders and interest groups in the planning process.
Principle 3: Forest Management Planning
<p>Recommendations:</p> <ol style="list-style-type: none"> 3: VFM, in collaboration with MNR, must develop a strategy to address the reliability of an aging FRI in support of the 2010-2020 FMP. 4: Corporate MNR must ensure that when a selected management alternative causes significant loss of habitat for a species in the context of the forest management unit, that the habitat implications are examined for that species at the ecoregional scale. 5: MNR must ensure that adequate resources are made available for the collection of values information, including socio-economic data on commercial (e.g. trappers, tourist outfitters, etc.) and non-commercial users of the Forest, in preparation for the next FMP. 6: VFM must amend SGRs to include red spruce as a species option. 7: VFM must ensure that age class substitution prevention strategies are included in the 2010-2020 FMP. 8: During the preparation of the 2010-2020 FMP, VFM must abide by the requirements of the 2004 FMPM with respect to the identification of contingency area unless updated by clear direction related to the implementation of NDPEG. 9: MNR and VFM must develop a strategy to ensure the sustainability of the hemlock resource on the Sudbury Forest, with considerations to include: <ol style="list-style-type: none"> a) inventory (including ability of the inventory to accurately reflect understorey hemlock occurrence, technologies to permit monitoring and updating in response to natural depletions). b) renewal and recruitment strategies (including considerations used to prioritize silvicultural effort – for instance, ungulate feeding pressure). c) pest management (occurrence, successional trends following disturbance, forest protection needs and strategies). 10: MNR must ensure that the FMP amendments master list is accurate. <p>Suggestions:</p> <ol style="list-style-type: none"> 3: MNR should continue to review the Sudbury Forest landbase to reclassify Crown Patent land that has reverted back to Crown and add it to the SFL. 4: VFM should, for the preparation of the 2010-2020 FMP: <ol style="list-style-type: none"> a) Review and revise operability age assumptions to consider minimum merchantable piece size by product for jack pine; b) Revise harvest area stability constraints to allow flexibility in projected harvest areas which may enhance socio-economic benefits from the Forest; c) Revise forest renewal limits by proportion for the base model to reflect biological/ecologically based limitations. Limits should be expanded in the Proposed Management Strategy to include additional management decisions if warranted. 5: VFM should include natural disturbances as being eligible for harvest, renewal and tending activities during preparation of the 2010-2020 FMP. 6: MNR should address strategic roads planning at scales above the SFL level in the Sudbury area to alleviate recurring conflicts on road use strategies. 7: MNR should provide a maintained copy of its roads strategy binder to VFM to facilitate planning and the updating of the road use strategies.

Table 14. continued

Principle 3: Forest Management Planning**Best Practice:**

2: VFM is commended for appending easily referenced tabular summaries of block by block compliance inspection priorities to the Annual Plans of Action.

Principle 4: Plan Implementation**Recommendations:**

- 11: VFM must ensure that sites where jewelweed compromises conifer renewal are monitored and treated to ensure survival and growth.
- 12: VFM must ensure contractors use water bars on ungravelled secondary and primary winter roads once operations are completed where there are moderate to steep approaches to water crossings.
- 13: MNR must ensure that aggregate pit permittees for pits used for the construction and maintenance of forest management roads on the Sudbury Forest comply with the requirements of the Aggregates Resources Act.

Suggestions:

- 8: VFM should explore slash management opportunities, including low complexity slash burns, in areas where tops were piled rather than burned due to concerns over proximity to highways and/or homes.
- 9: VFM should consult with MNR Science and Information experts regarding competition control on sites where jewelweed compromises conifer renewal.
- 10: VFM should ensure that increased supervision and training of tree planters be done where a contractor is new to tree planting.
- 11: VFM and MNR should work together to ensure effective strategies (e.g. early signing, gating, careful road placement etc.) are employed to restrict vehicular access where that is the use management strategy.

Principle 5: Systems Support

None

Principle 6: Monitoring**Recommendations:**

- 14: Both MNR and VFM must ensure that FIM timelines for reporting are met.
- 15: VFM must ensure that Free to Grow surveys are completed and that record keeping and completion of Annual Report Table AR-14 is done correctly.
- 16: VFM must make every effort to ensure that timelines for reporting requirements, as put forward in the new Forest Management Planning Manual (Phase-in) and Forest Information Manual, are met.
- 17: VFM must ensure that Annual Reports meet all requirements as identified in the 1996 FMPM or as phase-in requirements under the 2004 FMPM.
- 18: The MNR Industry Relations Branch, Forests Division must examine overall utilization in the Great Lakes - St. Lawrence Forest Region and actively pursue direction that increases utilization of lower quality fibre.
- 19: VFM must, during the preparation of the 2010-2020 FMP, use the tests of sustainability to examine the long-term implications of harvest operations on the Sudbury Forest continuing at their current level (i.e. social/economic impacts and impacts on wildlife habitat, etc.) so that it may quantify and better understand the impacts of this lost opportunity.

Suggestion:

- 12: MNR should consider stabilizing the suite of indicators used to assess forest sustainability.

Principle 7: Achievement of Management Objectives and Forest Sustainability

None

Principle 8: Contractual Obligations

None

Conclusion**Recommendation:**

- 20: Based on the outcome of this audit and performance with respect to its contractual obligations, the audit team recommends the Minister extend the term of the VFM Sustainable Forest Licence to March 31, 2028.

Appendix A

Comparison and Trend Analysis of Planned versus Actual Forest Operations Report

COMPARISON AND TREND ANALYSIS OF PLANNED VERSUS ACTUAL FOREST OPERATIONS REPORT

SUDBURY FOREST

July 6, 2006



Prepared By: Mark Lockhart
.....
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.....Planning Forester, VFM Ltd

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1.0 Introduction

1.1 Scope and Contents of the 2006 Trend Analysis

The tabular data as well as relevant discussion surrounding trends and comparisons in this report have been prepared by a Registered Professional Forester, in accordance with the requirement in Appendix C to the 2006 Independent Forest Audit Process and Protocol (IFAPP). The purpose of this report is to provide an interpretation of the current state of the forest relative to its past state and expected future condition.

The Comparison and Trend Analysis Report can be broken into seven focuses listed as follows:

- *What is the extent of the past, present and current area under management (Table 1);*
- *What are the past and present forest units used to describe the Sudbury Forest (Table 2);*
- *What are the past and present harvest volumes, both planned and actual (Table 3);*
- *What is the past and present harvest area, both planned and actual (Table 4);*
- *What is the forest unit area in the managed productive forest (Tables 5);*
- *What are the levels of past and present renewal and maintenance, both planned and actual (Table 6); and*
- *What percentage of the previously harvested area has been successfully regenerated (Table 7)?*

The current and past Forest Management Plans, the FRI, the Report of Past Forest Operations and the forest management planning system are used to compare the past, present and future conditions. Data and report availability for these are described for the Sudbury Forest in this report.

The 1990 to 1995 Timber Management Plans: These plans were written for the Killarney, Trout Lake and Wanapitei Crown Management Units. These plans were prepared by the Sudbury District MNR staff using 1977 aerial photography and a 1980 FRI. The forest was aged to 1990 to prepare the plans and wood supply calculations were made using the MADCALC model. While each of the three Timber Management Plans (TMPs) had their own Forest Units (FU), efforts have been made to group the units to allow for a reasonable summary of the planned and actual activities.

The MNR was responsible for planning and management of all operations for the entire 1990-1995 term. While provision of data for this term is not required as per the Independent Forest Audit Protocol Appendix C – data that was readily available in preparation of this report is included for trend analysis purposes.

The 1995 to 2000 Timber Management Plan: The three management units in the Sudbury District (i.e., Killarney, Trout Lake and Wanapitei) were amalgamated to form the Sudbury Crown Management Unit in 1994. Like the 1990-1995 TMP, the 1995-2000 plan was also prepared by the Sudbury District MNR staff. New 1989 aerial photography and a preliminary FRI was used to prepare the plan. The forest was aged to 1995 and wood supply calculations were undertaken using the MADCALC model.

In June 1998, the Minister of Natural Resources issued a Sustainable Forest Licence (SFL) to The Vermilion Forest Management Company Ltd (VFM). Under its SFL, VFM became responsible for planning, monitoring and reporting for all forest management activities. VFM also became responsible for all renewal activities such as site-preparation and tree planting.

The 2000 to 2005 Forest Management Plan (FMP): This plan was prepared by VFM under the direction of the Sudbury District MNR using the *Forest Management Planning Manual for Ontario's Crown Forests* (OMNR 1996). A new digital forest inventory based on 1989 aerial photography was used to produce the FMP. The forest was aged to 2000 and the wood supply calculations were determined using the Strategic Forest Management Model (SFMM).

The 2005 to 2010 Forest Management Plan: The 2005-2010 Sudbury Forest Management plan was prepared by VFM following the direction of the 1996 FMPM. This plan used the same digital forest inventory as its predecessor to produce the FMP, based on 1989 aerial photography. The forest was aged to 2005 and the wood supply calculations were determined using SFMM. This was the last plan completed as per the requirements of the 1996 FMPM – subsequent FMPs will be executed in accordance with the 2004 FMPM. Phase-in provisions were made for plans completed under the 1996 FMPM, mainly pertaining to the reporting structure.

This report was completed during the 2005-2010 Forest Management Planning term, and therefore actual figures for this term are limited due to the timing of the Independent Forest Audit (August 2006) in relation to completion of the 2005-2006 Annual Report (November 2006). For the previous term, 2000-2005, the trend data relies on the 2004-2005 Year Ten Annual Report, which has been completed for the term in accordance with the phase-in requirements of the 2004 FMPM.

Other relevant reports supporting the creation of this trend analysis are the 1995-2000 Report of Past Forest Operations (RPFO), assembled by VFM's Planning Forester authoring the 2005-2010 FMP.

1.2 Past Independent Forest Audits

Vermilion Forest Management Company Ltd. has been a part of one previous Independent Forest Audit in 2001, just after completion of its initial Forest Management Plan for the Sudbury Forest. The Audit Team was to determine whether the management of the Sudbury Forest was consistent with the general principles of sustainable forest management during the review period 1996-2001. As a result, VFM's sustainable forest licence was extended for five years.

The Audit Team made 16 recommendations to address shortfalls and areas of improvement that considered to be significant. In co-operation with the MNR, the VFM developed an action plan to address these recommendations as well as a status report to update progress. The final audit report, action plan and status reports as a result of the 2001 audit have been provided to the 2006 audit team.

1.3 Amendments

There were a total of 92 amendments on the Sudbury Forest for the 2000-2005 FMP. The total amendments included no major, 1 minor and 91 administrative. The minor amendment brought in new regular allocation for Gervais Forest Products to make up for losses in a blow-down area. It was necessary to bring in new area since there wasn't sufficient area (of the correct forest units) available in contingency. Many of the aforementioned administrative amendments were the result of values updates on the landbase. Upon regulation of the 2004 FMP Manual, new values information no longer requires an FMP amendment, eliminating many of the administrative plan amendments.

2.0 Trend Analysis Text and Tables

2.1 Summary of Total Area under Management

It is difficult to track meaningful data for the intent of this table due to numerous land use planning adjustments to the landbase over the last 15 years. The most significant shifts on the Sudbury Forest Management Unit have resulted from Ontario Living Legacy exercise, and partial unit amalgamation with a portion of the Spanish Forest. Small adjustments made to patent lands within the management unit has shifted the Crown component of the landbase each year, making any meaningful conclusions impossible from this table.

The data for Table 1 was obtained from Table 4.8.2 for each of the 1990, and 1995 terms and from Tables FMP-1 and FMP-2 for the 2000 and 2005 FMP terms. As mentioned previously, the 1990-1995 TMP was based on 1980 FRI and the 1995-2000 TMP as well as the 2000-2005 and 2005-2010 FMPs are based on the new FRI derived from 1989 aerial photography.

The decrease in total managed production forest from the 1990-1995 TMP to the 1995-2000 TMP was mainly a result of the new inventory better defining non-forested areas such as rock, (the amount of protection forest in 1990 dropped from 51,970 hectares to 10,419 hectares in 1995). The decrease in the total managed productive forest from the 1995-2000 TMP to the 2000-2005 FMP was mainly the result of the provincial government's Ontario Living Legacy (OLL) decision to increase the amount of parks and protected areas in the province. As a result of this initiative the total area available for management was reduced.

The new inventory for the 1995-2000 FMP resulted in a reduction of area in barren and scattered from approximately 95,350 hectares to about 14,210 hectares. As previously mentioned, the amount of protection forest was also reduced significantly with the delineation of rocky areas which were consequently transferred from protection forest into non-forested area. The new inventory has also resulted in improved classification of other hardwoods and other conifers into their appropriate working groups.

The new FRI completed for the 1995-2000 TMP and the OLL decision to increase the number of parks and protected areas has resulted in a loss of 12% of the total production forest available for management and a drop of 24% in the total managed forested land base within the Sudbury Forest from the 1990-1995 TMP to the 2000-2005 FMP.

The drop in overall Crown Managed area between 1995 and 2000 due to OLL withdrawal was counteracted by the addition of land base from the Spanish Forest SFL totalling approximately six townships of area. The net difference between these two occurrences increased the land base by more than 25,000 ha of Crown Managed forested land. Biggest increases in working groups were noted in Jack Pine, Poplar and White Birch – differences of 17,000, 4,000 and 10,000 ha respectively.

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Past and Current Plans - Crown Managed

Table 1 - SUMMARY OF TOTAL AREA UNDER MANAGEMENT

Land Type	Plan Term	Area in hectares			
		Past Plans			Current
		1990-1995 ¹	1995-2000 ²	2000-2005 ³	2005-2010 ⁴
Non-Forested					
Other Land		5,538	669	19,387	104,597
Forested					
Non-productive		103,672	72,255	57,581	62,717
Productive					
Protection		51,970	10,419	8,560	10,882
Production Forest					
B&S / NSR		95,350	14,210	20,228	4,964
Depleted		-	-	-	31,468
Forest Stands by Working Group					
Pw		44,355	63,874	60,050	61,458
Pr		10,476	9,744	8,059	7,993
Pj		57,238	64,513	58,639	73,743
S		51,024	64,604	56,963	58,562
B		24,615	23,940	22,102	22,976
Oc		1,297	977	225	207
Ce		4,645	10,405	5,586	5,185
He		3,581	-	2,809	2,832
Po		48,745	71,381	66,257	70,323
Bw		84,668	79,667	73,238	83,995
Mh		13,227	6,928	5,139	5,313
Oh		12,183	21,354	18,876	18,839
Total Production Forest		451,404	431,597	398,168	411,424
Total Forested Land		607,046	514,271	464,309	489,987

¹ Source: Sudbury District MNR - Sum of 3 plans (Killarney, Trout Lake & Wanapitei) which make up current Sudbury Forest

² Source: Sudbury District MNR

³ Source: Table FMP-1 and FMP-2 2000-2005 FMP

⁴ Source: Table FMP-1 and FMP-2 2005-2010 FMP

⁵ Note: Difference in Total Forested Land between 1995 and 1990 is the boundary revision to F.R. #3

Difference in Total Forested Land between 1995 and 2000 is due to OLL

Difference in Total Forested Land between 2000 and 2005 is due to Management Unit Boundary Adjustment

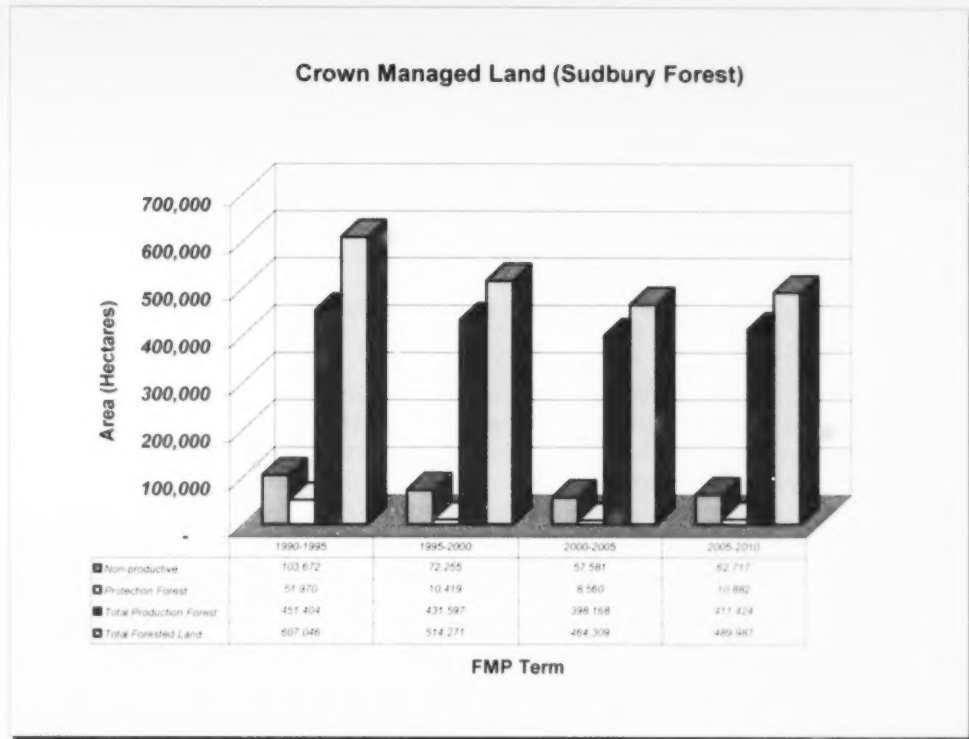


Figure 2. Summary of Managed Crown Land on the Sudbury Sustainable Forest Licence.

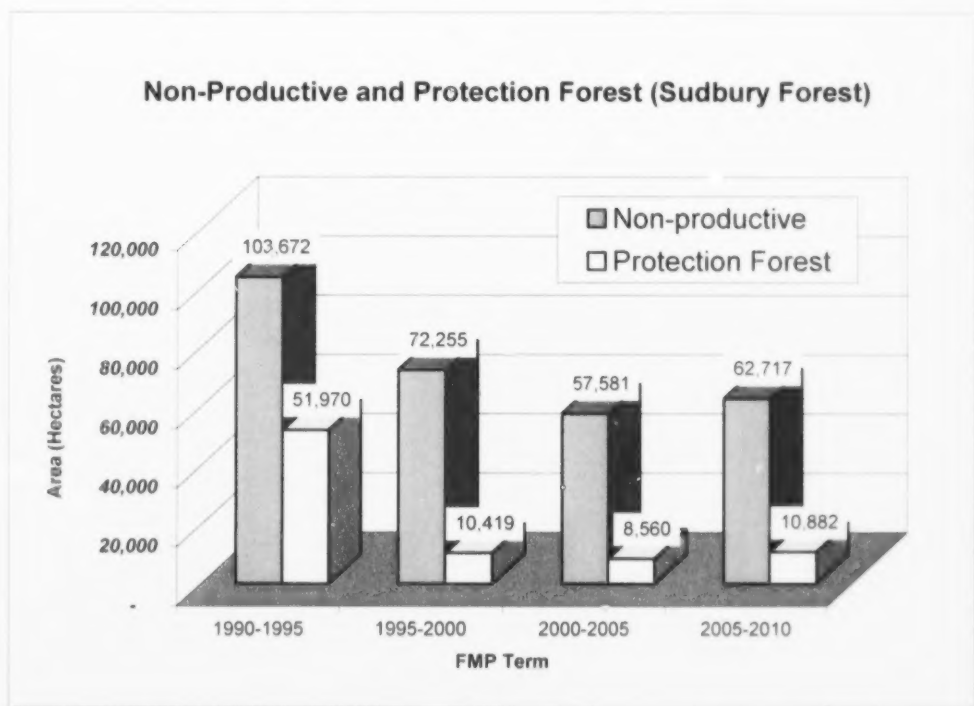


Figure 3. Summary of Non-Productive and Protection Forest on the Sudbury Sustainable Forest Licence.

2.2 Summary of Forest Units

Tables 2a, 2b and 2c describe the forest units that were used in the 2000-2005 FMP, the 1995-2000 TMP and the 1990-1995 TMP respectively. The forest units used for the 1990 and 1995 TMPs were based primarily on working group, while those for the 2000 FMP are based primarily on forest ecosystem classification (FEC) types in combination with species composition.

The forest units for the 2000 FMP were developed with the assistance of MNR's South Central Science & Technology Unit and are based on the Field Guide to Forest Ecosystems of Central Ontario (OMNR 1997). These forest units are based largely on vegetative forest cover communities. The new forest units more accurately represent the mixed forest conditions found on this forest and are a better reflection of wildlife habitat units used for modeling wildlife habitat.

The methodology for developing forest units has changed since the 2000 FMP was written. In the past, each FMP team in the province developed its own forest units for each FMP. Forest units sometimes changed from one FMP to another within the same management unit. In addition, forest units were usually different from one management unit to another. The inconsistency between and within management units made it difficult to compare forest cover types between multiple management units as well as from one FMP to another within the same management unit. For this reason, MNR introduced standardized forest units (SFUs) in the last five-year term. Figure 4.1 in the 2005 FMP shows the relationship between forest units in the 2000 FMP and 2005 FMP.

The Planning Team for the 2005 Sudbury Forest Management Plan grouped the MNR's "template" 31 habitat units into broader categories, with the intention of creating sensible forest units. The goal of the exercise was to strike a balance between limiting the number of forest units for practical purposes (e.g. calculating targets and implementing FMP strategies) and considering significant ecological, functional and developmental differences in forest types. The goal of balance was achieved after detailed analysis of the planning inventory combined with consultation with the planning team, the MNR District, Region as well as Southern Science and Information FMP advisors.

There are 16 forest units on the Sudbury Forest. Table 2a provides a description of each, including the relationship between forest units and the forest ecosystems of Central Ontario (FEC), most commonly referred to as ecosite. A description of the silviculture system that will be implemented on each forest unit, forest type and dominant working group is also shown in Table 2a.

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Table 2a - DESCRIPTION OF FOREST UNITS (FMP-8) 2005-2010 FMP

Forest Unit Code	Forest Unit Name	Forest Type	Main Working Group	Site Types	Silvicultural System	FRI Parameters & Criteria	Additional Information
BW	White Birch Hardwood Mix	Intermediate Hardwood	BW P3 L41	17, 18	1. Selective	Refer to Figure 4.3 and 4.4	Refer to Figure 4.5
MW	Mixedwood Dry	Normal Mixedwood	BW P3	19, 21, 28, 30, 37	1. Selective		
MW2	Mixedwood Moist (Rich)	Rich Mixedwood	BW P3	1, 18, 20, 30	1. Selective		
PJ	Jack Pine	Conifer	PJ	18	1. Selective		
PJSD	Jack Pine Upland Black Spruce Mix	Conifer	PJSD	26, 25, 24, 39	1. Selective	Refer to Figure 4.5	Refer to Figure 4.5
PI	Poplar	Intermediate Hardwood	PI	17, 18, 19	1. Selective		
PR	Red Pine	Conifer	PR	12	1. Selective		
PWS1	White Pine Seed Tree	Mixedwood	PW P3 PR B3	11, 32, 33, 34	1. Selective (Seed Tree)		
SH1	Black Spruce Lowland Conifer	Towhee Conifer	SH1 C	3, 36, 32	1. Selective	Refer to Figure 4.5	Refer to Figure 4.5
SH	Spruce Fir	Conifer	SH10, BW SW	16, 20, 21	1. Selective		
SH	Hybrid Hardwood	Hybrid Hardwood	SH1, SH	11, 22, 12, 23	1. Selective (Shelterwood)		
SH1 S	Intermediate Hardwood Intermediate Mixedwood	Intermediate Hardwood	SH1	18, 37	1. Selective (Shelterwood)		
SH	Hardwood	Conifer	SH	4, 29	1. Selective (Shelterwood)	Refer to Figure 4.5	Refer to Figure 4.5
EWMS	Lowland Mixedwood	Towhee Conifer and hardwood	SH (P3 C)	14, 21, 11	1. Selective (Shelterwood)		
PWS	White Pine Upland Mixedwood	Conifer	PW	13, 30, 24, 24, 39	1. Selective (Shelterwood)		
SH1	Hybrid Hardwood	Hybrid Hardwood	SH	39, 28	1. Selective		

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Table 2b - DESCRIPTION OF FOREST UNITS (FMP-8) 2000-2005 FMP

Forest Unit Code	Forest Unit Name	Forest Type	Main Working Group	Site Types	Silvicultural System	FRI Parameters & Criteria	Additional Information
PW P3	White Pine Red Pine Upland Hardwood	Conifer	PW P3	11, 36, 25, 26, 39	1. Selective (Shelterwood)	PW P3 type criteria	No additional info.
MW (a)	Mix Conifer Upland Hardwood	Mixedwood (Intermediate Hardwood)	PW B3, B4	1, 11, 18, 24, 25, 26, 39, 37	1. Selective (Shelterwood)	Mixedwood with high canopy hardwood	
MW (a)	Mix Conifer Upland	Mixedwood (Intermediate Hardwood)	BW B3, B4	1, 11, 20, 21, 22, 23, 24, 25, 26, 39, 37	1. Selective	Mixedwood and intermediate hardwood	
PW B3, B4	White Pine Hardwood Upland Mixedwood	Conifer (Intermediate Hardwood)	PW B3	4, 36, 17, 28, 39, 23	1. Selective (Shelterwood)	Mixedwood with high canopy	
PJ	Jack Pine (Rich)	Conifer	PJ	17, 18, 30, 37, 39	1. Selective	Jack Pine (Rich) and mixedwood	
SH	Hybrid Hardwood	Conifer	SH	11, 22, 12, 23	1. Selective	Hybrid Hardwood and mixedwood	
SH1	Black Spruce Lowland	Conifer	SH1	3, 36, 32	1. Selective	Black Spruce Lowland and mixedwood	
SH1 S	Intermediate Hardwood Intermediate Mixedwood	Intermediate Hardwood	SH1 S	18, 37	1. Selective	Intermediate Hardwood and mixedwood	
SH	Hardwood	Conifer	SH	4, 29	1. Selective	Hardwood and mixedwood	
EWMS	Lowland Mixedwood	Towhee Conifer and hardwood	EWMS	14, 21, 11	1. Selective	Lowland Mixedwood and mixedwood	
PWS	White Pine Upland Mixedwood	Conifer	PWS	13, 30, 24, 24, 39	1. Selective	White Pine Upland Mixedwood and mixedwood	

1. Not Figure 18, Excluded (No Apparent Fire Effect) and Figure 17, Excluded (Shelterwood Criteria) (2000-2005 FMP)

2. Current silvicultural system may be variable (forest may be managed with high canopy hardwood)

3. Not Forest Unit Specific Comparison, Not Class and Working Group Applicable (11 to 39 Series in Intermediate Hardwood and 11 to 39 Series in Intermediate Hardwood and 11 to 39 Series in Intermediate Hardwood)

4. Source: Table FMP-8 2000-2005 FMP

Table 2c - DESCRIPTION OF FOREST UNITS 1995-2000 TMP

Source: 74, downloaded from pages 237-247 in 1996, 240, 1 AM

2006 Independent Forest Audit

Sudbury Forest Management Unit

Table 2d - DESCRIPTION OF FOREST UNITS 1990-1995

Combination of the Killarney, Wanapitei and Trout Lake Management Units (now Sudbury Management Unit)

* Not exactly the same in each plan. Some amalgamation has been done so antiquities can be studied.

Source: Sudbury District MNR.

2.3 Summary of Planned vs Actual Harvest Volumes

Table 3 shows planned and actual harvest volume by species on an annual basis. Information for planned volumes was obtained from the respective plans and information for the actual volumes harvested were obtained from the MNR's billing and scaling system. Please note that at the time of preparing this report, harvest volumes for the 2005-2006 period were not available from the MNR.

Information for planned volumes was obtained from the 1995 FMP (Table 4.18.1); from the 2000 FMP (Table FMP-23), and finally from the 2005 FMP (Table FMP-23). Information prior to 1995 was obtained from the Sudbury District records. Actual data has been collected from the Sudbury District MNR for years prior to 1995, AR-3 for years between 1995-2000, and AR-5 for years within the 2000-2005 reporting period. Data for each planned and actual term has been annualized to reflect more comparable information between terms. Figures 4-7 summarize volume by species grouping data presented in Table 3. The planned volumes for the 2000 FMP and current 2005 FMP are higher (even though the landbase has been reduced) as a result of basing the yield curve information used in modeling on actual yields obtained during the previous two planning periods.

Noticeable increases in the planned volume estimates from the Sudbury Forest are evident when comparison is made to the 2000 FMP. There has been a significant increase in the estimated growing stock on the Sudbury Forest when compared to the estimate in the previous FMP. SFMM estimates the current growing stock on the Sudbury Forest to be 40,094,815 m³. This is an increase of 8,080,202 m³ from the 2000-2020 FMP. This increase is attributable to two main factors:

- 1) *Foremost is the 48,155 ha increase in productive area on the Sudbury Forest Management Unit brought about by an administrative addition from the Spanish Forest as discussed in Section 2.1. 90% of this forest is relatively high-volume stands between 50 and 100 years old dominated by PJSB, PJ, MW1, PO and BW forest units.*
- 2) *To a lesser extent the increase is also attributable to the utilization of statistically rigorous yield curves developed by Dr. Margaret Penner with the Forestry Research Partnership for some forest units, including BW, PJ, PJSB, PO, PWST, SBLC, SF, HDUS, PWUS and HDSEL. This contrasts the past FMP that used Plonski yield curves for all forest units. Literature detailing the development of the Penner yield curves and comparisons to Plonski-derived curves is available online at: http://www.forestresearch.ca/product_catalogue/reports.htm. In general, the curves indicate that expected peak volumes are, with some exceptions, greater and that forest stands hold the volume longer when compared to Plonski yield estimates.*

The result is an overall increase in yield expectation when compared the past plan.

While the amount of hardwood harvested in the 1995 plan increased from the 1990 plan, problems continue in finding markets for low quality birch and dense hardwood pulp. The weak markets for hardwood pulp has also resulted in many mixed conifer stands not being harvested. In 1999, the MNR tendered a request for proposals for new facilities to utilize this surplus hardwood. While the MNR did receive proposals elsewhere in Northeastern Ontario, no new proposed facilities are being established in the Sudbury area. As a result, it is expected that the allowable harvest will not be completely utilized again in this current plan.

A step forward in predictive modelling was made with the planning team's decision to improve yield information and use locally specialized data for some standard forest units for the 2005 FMP. Yield curves in the 2005 FMP originated from two different sources depending on the SFU. Some were based on Plonski Modified pure species curves developed in SFMMTool. For others, yield curves were developed by the Forestry Research Partnership (FRP) Benchmark Yield Curve Project undertaken by Dr. Margaret Penner, private consultant and Murray Woods, OMNR in cooperation with other government and industry staff.

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Sudbury Forest Management Unit
Table 3 - Summary of Planned & Actual Harvest Volumes

Average Planned Annual Harvest Volumes

Volumes are Annualized for the indicated 5 year period

Species	Volume in '000's cubic metres			
	Past Plans			Current
	1990 ¹	1995 ²	2000 ³	2005 ⁴
Pw	58.9	42.2	48.8	96.7
Pr	21.6	14.0	14.4	25.6
Pj	82.8	71.8	67.6	154.3
Sp	37.7	33.0	60.8	86.6
Oc	2.6	6.1	28.7	28.5
M	6.2	5.5	7.0	2.7
Bw	49.8	34.7	60.9	78.6
Po	38.9	42.1	85.6	115.0
Oh	11.0	2.9	7.4	12.3
Total Planned Volumes	309.5	252.4	381.3	600.4

¹ Source: Sudbury District MNR.

² Source: Table 4.18.1 1995-2000 TMP.

³ Source: Table FMP-23 2000-2005 FMP.

⁴ Source: Table FMP-23 2005-2010 FMP.

Actual Harvest Volumes

Volumes are Annualized for the indicated 5 year period

Species	Volume in '000's cubic metres			
	Past Plans			Current
	1990 ⁵	1995 ⁶	2000 ⁷	2005 ⁸
Pw	39.2	36.1	46.7	
Pr	17.0	16.4	21.2	
Pj	69.1	72.6	61.8	
Sp	17.4	22.5	41.7	
Oc	0.1	0.5	1.4	
M	0.7	1.6	2.9	
Bw	6.8	7.5	18.3	
Po	14.4	25.2	40.1	
Oh	4.1	1.6	0.6	
Total Actual Volumes	168.8	184.0	234.6	0.0

⁵ Source: Sudbury District MNR.

⁶ Source: Table AR-3 1995-2000 inclusive.

⁷ Source: Table AR-5 2004-2005 Annual Report (2004 FMPM).

⁸ Note: Volumes for 2005-2006 fiscal year are not reported until November 2006.

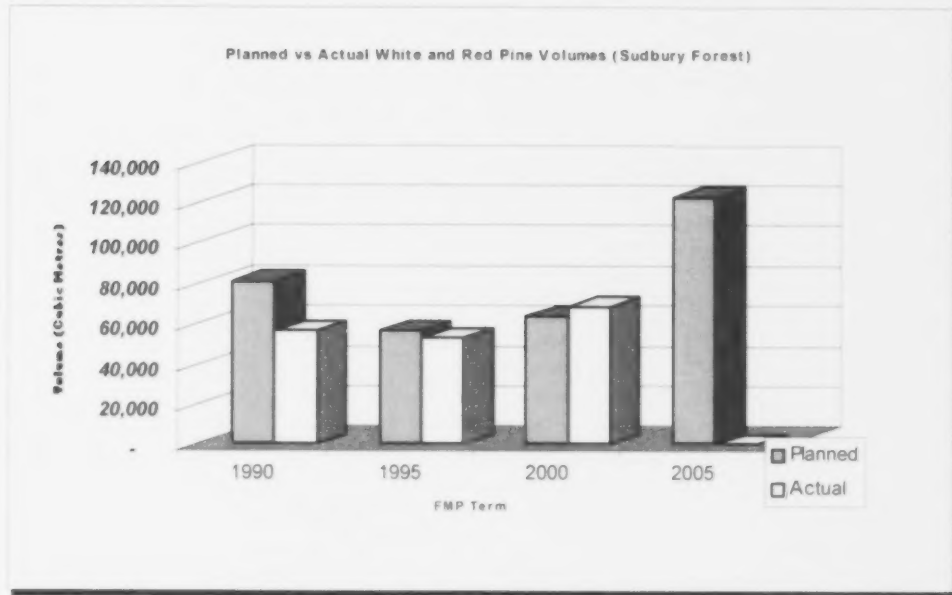


Figure 4. Summary of Red and White Pine Volumes Utilized from the Sudbury SFL.

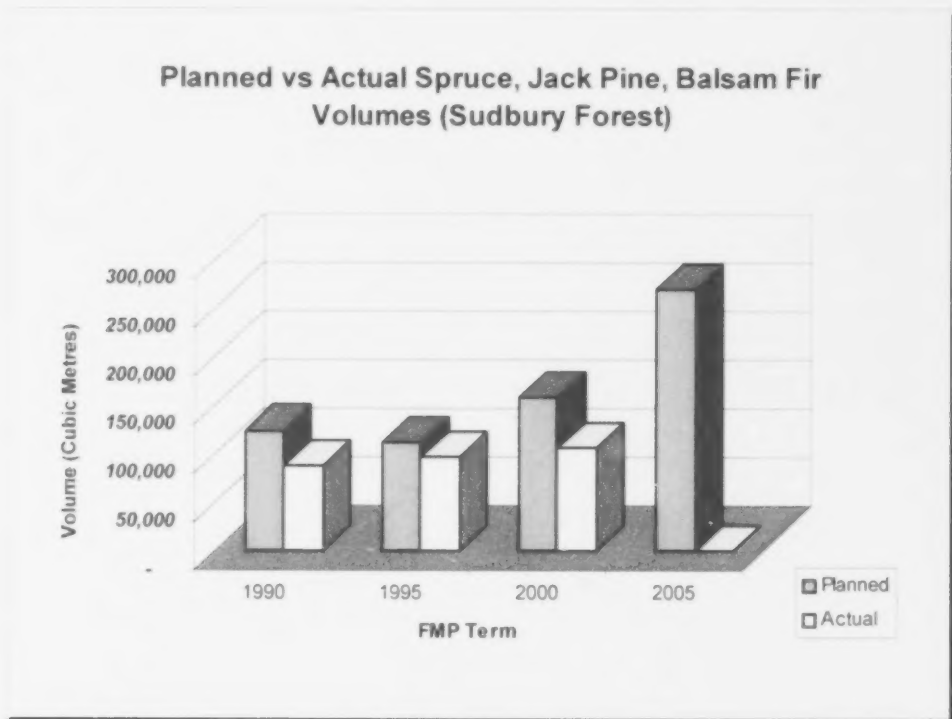


Figure 5. Summary of Spruce, Pine and Fir Volumes Utilized from the Sudbury SFL.

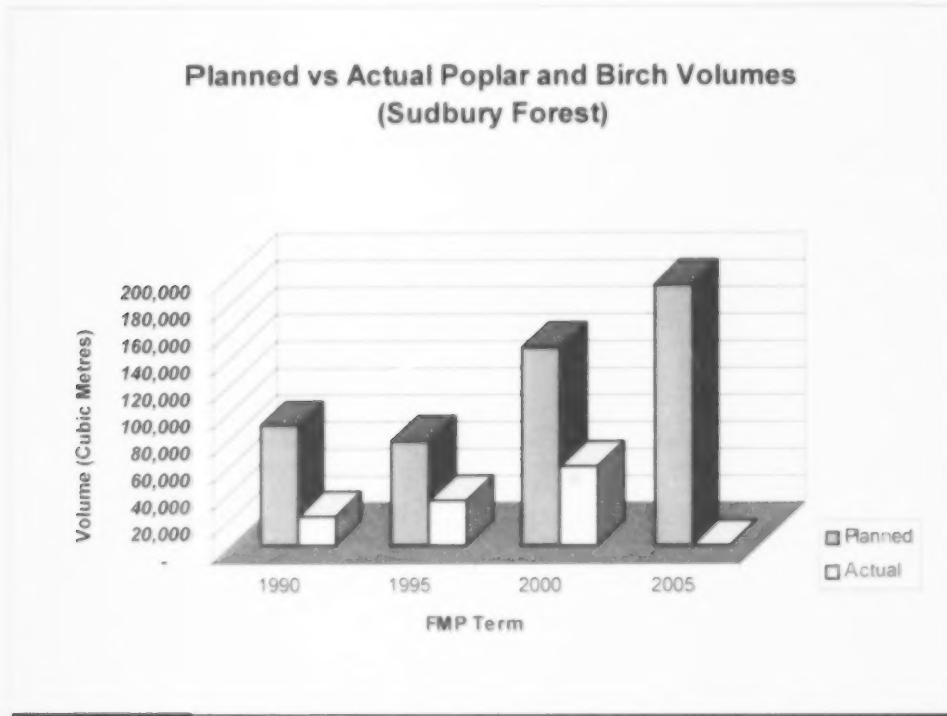


Figure 6. Summary of Poplar and Birch Volumes Utilized from the Sudbury SFL.

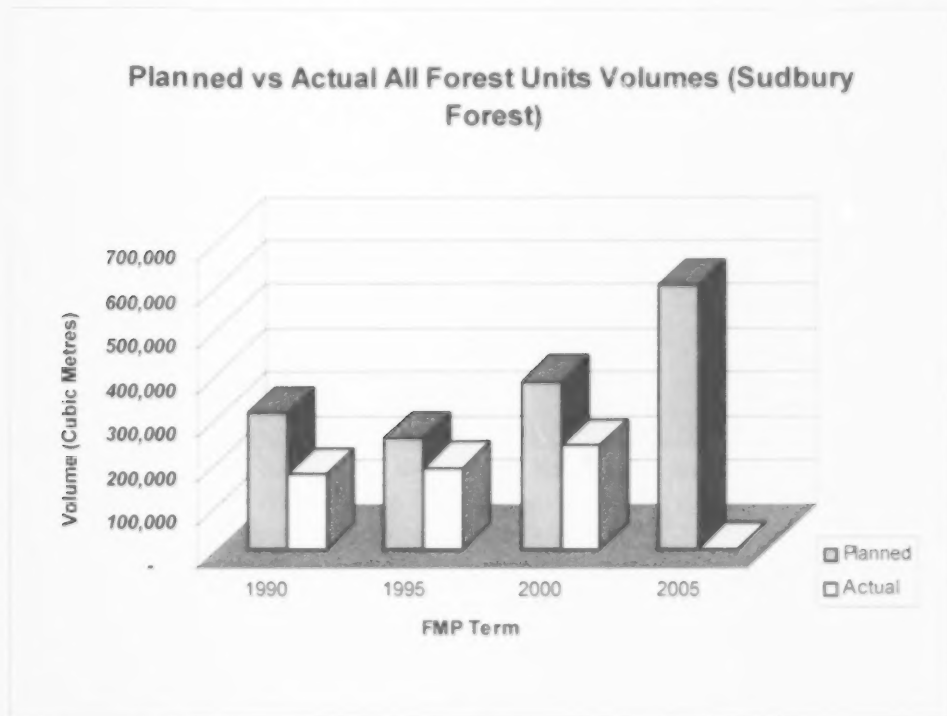


Figure 7. Summary of All Forest Unit Volumes Utilized on the Sudbury SFL.

2.4 Summary of Planned vs Actual Harvest Areas

The actual harvest areas in Table 4 have been annualized for three prior terms, 1990, 1995, and 2000. The current term actual figures are not available as harvest levels are yet to be reported for the first operating year of the FMP. Figures 8-11 summarize area harvested by forest type from data presented in Table 4.

The total allowable harvest area over the past three terms has remained relatively steady (5,781 ha/year for the 1990 term; 6,308 ha/year for the 1995 term; and 5,809 ha/year for the 2000 term) according to forecast figures from the TMPs and FMPs. The current term has an annual allowable harvest forecast similar to historic figures at 6,673 ha/year.

Total actual harvest area has fluctuated more significantly with only 66% of the planned area being harvested during the 1990 term, 81% being harvested in the 1995 term and 49.8% of the planned annual area was harvested in the five-year breakdown for the 2000 term. The primary reason that actual harvest area is only about half of planned harvest area for all three terms is largely due to a continued absence of consistent markets for hardwood pulp from both tolerant and intolerant hardwood species.

The 2005 actual figure from the first year of harvest of the current term is expected to follow similar trends to years of the past, in spite of further declining markets.

Table 4 - SUMMARY OF PLANNED AND ACTUAL HARVEST AREA

Past and Current Plans

Area is Annualized for the indicated period

Planned Annual Harvest Area				Actual Harvest Area							
				Area in hectares				Area in hectares			
				Past Plans			Current	Past Plans			Current
Forest Unit				1990 ¹	1995 ²	2000 ³	2005 ⁴	1990 ³	1995 ⁴	2000 ⁶	2005 ⁷
2005	2000	1995	1990								
PWLS	Pw Plus	PWR	PWR	880	1,186	580	1,632	826	1,143	348	
PR	Mix Conus					1,456	43			810	
PWS1	Mix Conus	BL			325	1,100	428		125	463	
PJ	PwOakHdus					220	412			111	
SBLC	Pjss	PJ	PJ	921	1,095	600	87	774	629	418	
PJNB	Sbss	SB	SPRUC1	970	504	912	912	622	263	265	
CT	LowMixus	OC1	OC	150	164	132	58	29	5	30	
ST							760				
LAWN							52				
HI							29				
Subtotal Conifer Management:				2,930	3,574	4,603	4413	2,254	2,166	2,446	
HDS11	Hdss1	MNS-HH	HH	204	169	332	154	175	197	49	
HDS	Hdss	OHF	OH	258	185	124	120	224	31	46	
Subtotal Tolerant Hardwood Management:				462	655	456	274	399	228	94	
MW1							515				
MW2	PwBwMixus	BW, PO	BW, PO	2,388	2,079	750	350	1,165	694	358	
BW							877				
PO							244				
Subtotal Intolerant Hardwood Management:				2,388	2,079	750	1,986	1,165	694	358	
Total Area:				5,781	6,308	5,809	6,673	3,815	3,087	2,898	

⁴ Source: Sudbury District MNR.

² Source: Table 4.15 (1995-2000) TMP.^a Source: Table 1 AIP-19 2000-2005 I AIP

* Source: EMP 19 2005, 2010 EMP

⁵ Source: Table AR-1 1999, 2000 AR.⁵ Harvest area for 2000-2005 period collected from 2004-2005 Ten Year Report

* Actual harvest for the 2005-2006 fiscal year will not be available until November 2006

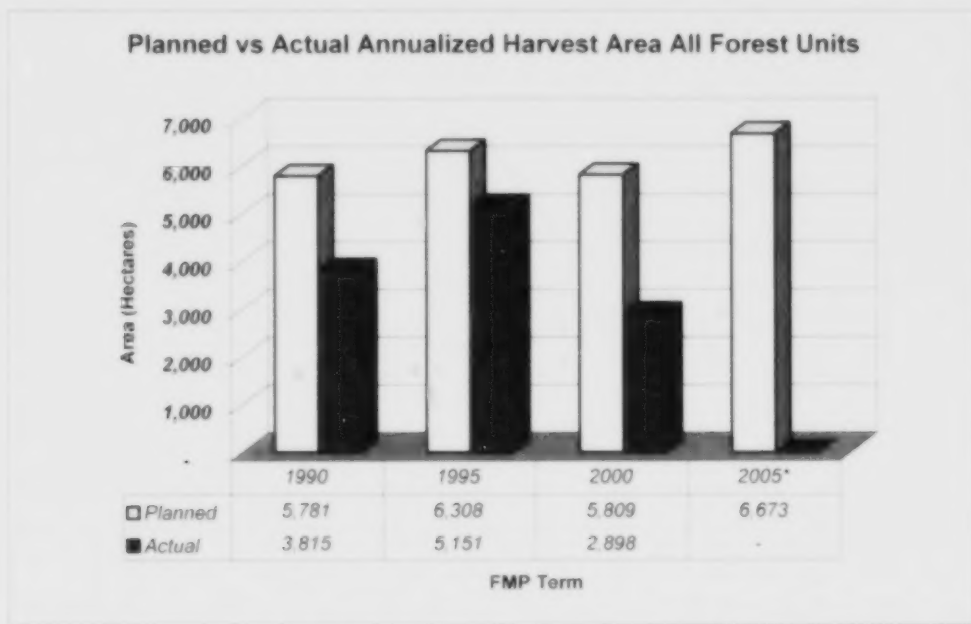


Figure 8. Summary of All Forest Unit Area Harvested on the Sudbury Sustainable Forest Licence.

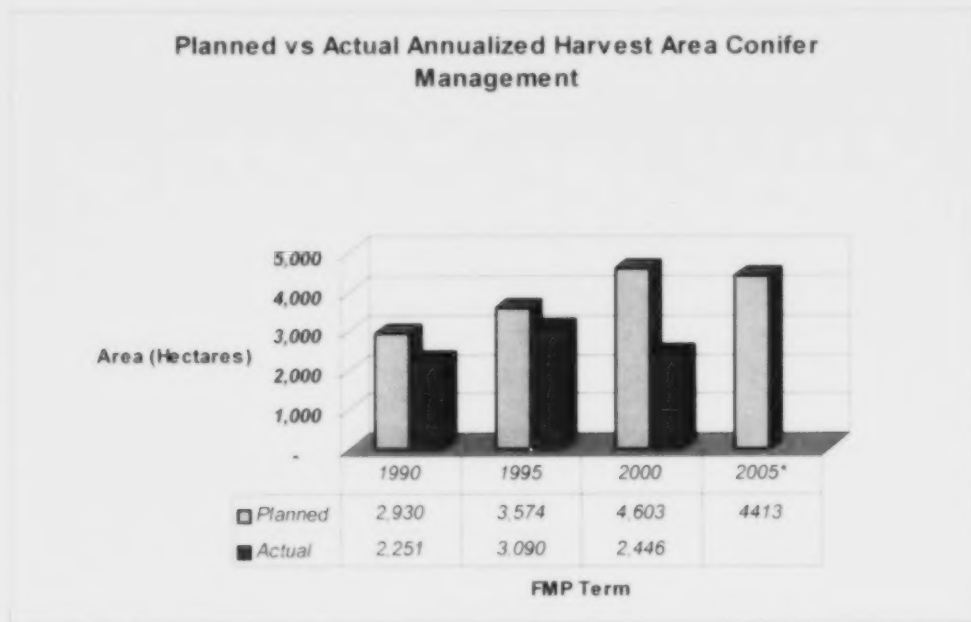


Figure 9. Summary of Clearcut Managed Area Harvested on the Sudbury SFL.

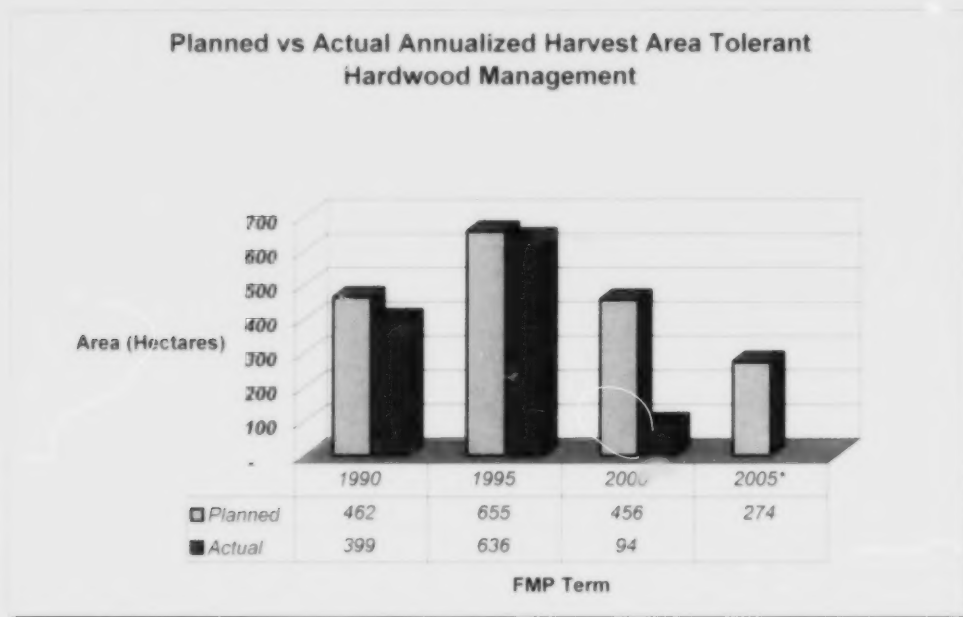


Figure 10. Summary of Tolerant Hardwood Managed Area Harvested on the Sudbury SFL.

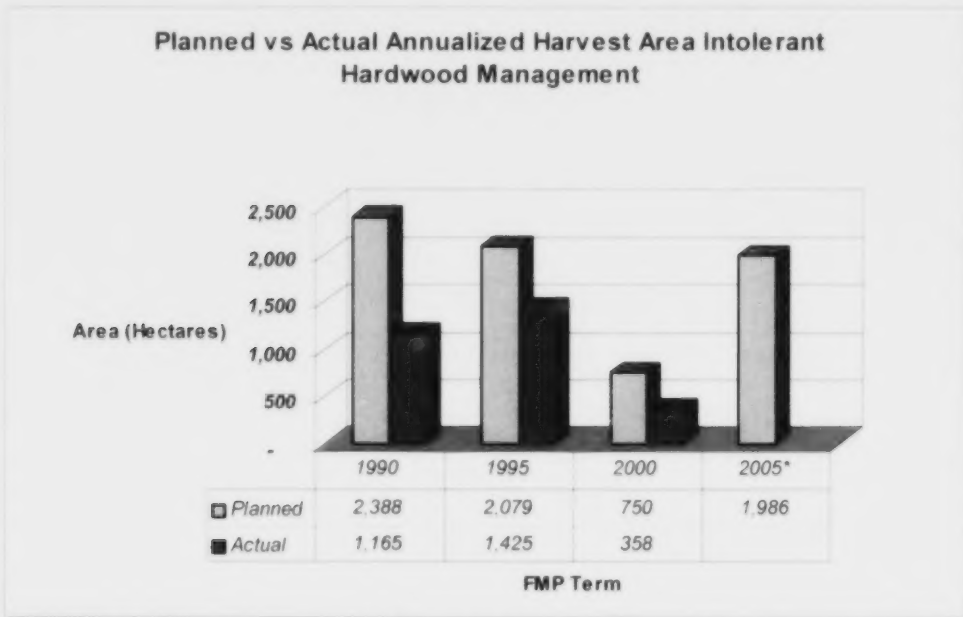


Figure 11. Summary of Intolerant Hardwood Managed Area Harvested on the Sudbury SFL.

2.5 Summary of Managed Productive Forest by Forest Unit

Tables 5a through to 5d can be found in Appendix 1 of this report. Table 5a provides a summary of managed productive forest by forest unit and age class for the current term. The data is the same as Table FMP-9 from the 2005 FMP. Tables 5b and 5c show area by forest unit for the two previous terms. Information for Table 5b was derived from 2000 FMP-9, information for Table 5c was derived from TMP Table 4.13.1, while information for Table 5d was derived from TMP Table 4.9. For the 1990 plan, a summary of area by forest unit and age class was not available. Therefore, the area within the working groups was slotted into the most appropriate forest unit. For example, the area within Pw and Pr working groups in the 1990 TMP was tabled under the PWR forest unit.

Table 5d (compiled from Tables 5a, 5b, and 5c) demonstrates the age class structure for the entire managed productive forest, all forest units combined, for the current term and for the two previous terms. Figure 4 illustrates the impact of the new inventory used in the 1995 and 2000 plans. Compared to the old inventory, the new inventory has a much better balance of age classes. This more even balance reduces fluctuating harvest levels and maintains wildlife habitat.

Data from these tables has been summarized in Figure 12 by forest type. Comparing landbase trends using forest units has proven to be a challenge throughout this report, therefore forest types have been grouped into conifer, tolerant hardwoods and intolerant hardwoods in attempts to facilitate trend identification in a general way.

Table 5d is a compilation of Tables 5a, 5b and 5c demonstrating the age-class structure for the entire managed productive forest, all forest units combined, for the current and two previous terms.

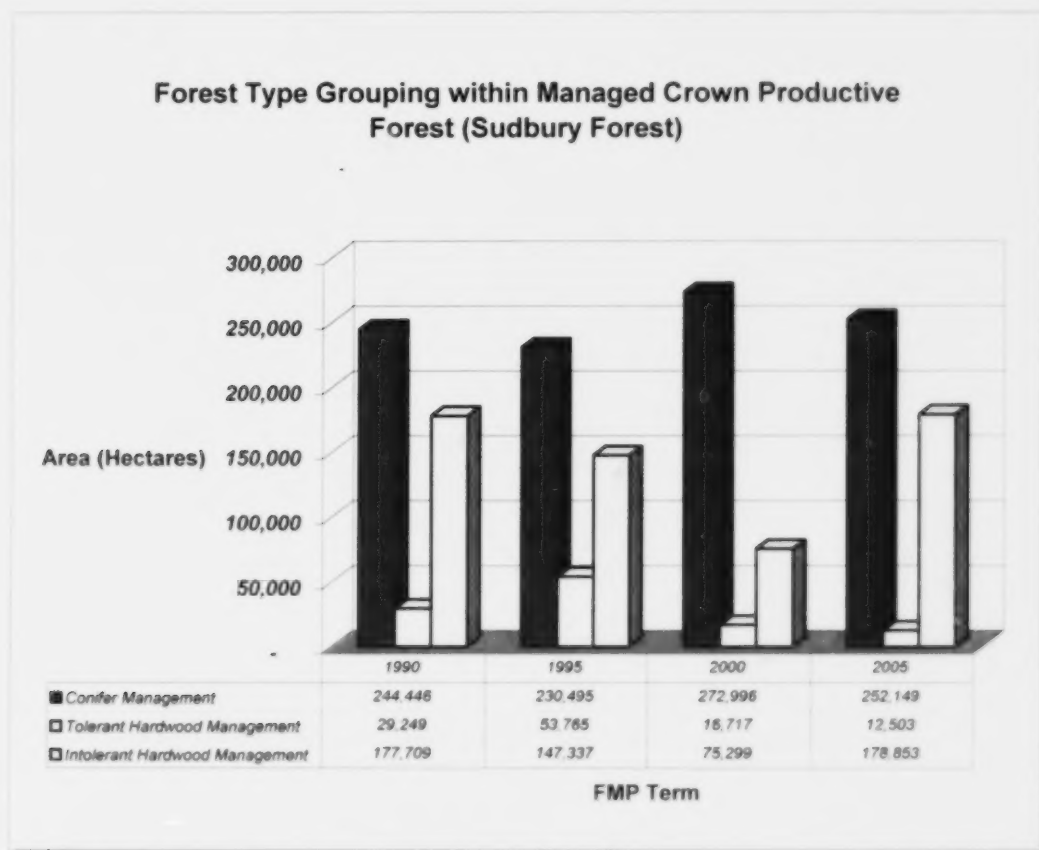


Figure 12 Forest Type Distribution within Managed Crown Productive Forest.

Figure 13 illustrates that in 2000, a more even ageclass distribution among the first three age classes (B&S, 1-20 and 21-40) than in the previous term. Figure 14 also shows less area in the 121+ age class in 2000 than there was in the previous two terms. This is a result of the MNR policy that was in place for many years to harvest the "oldest first". The 2000 FMP contains a strategy to maintain a range of age classes in each forest unit, as well as to approach a more balanced age class distribution in each forest unit which is anticipated to result in more area in the 121+ age class. The charts in Figure 14 are for comparative purposes illustrating the individual age class structure within each planning term.

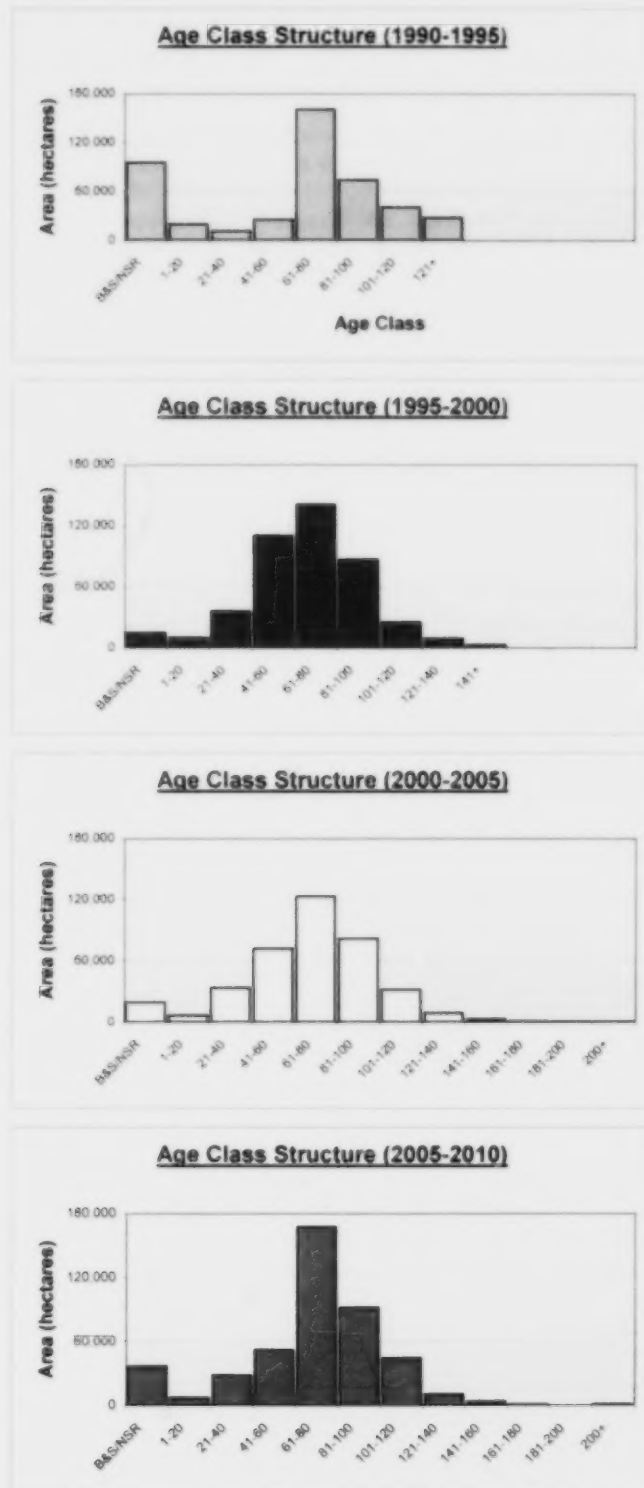


Figure 13 – Age Class distribution from 1990 to 2005 on the Sudbury Forest.

Age-class distribution on the forest appears to be steadily improving as of the start of the current management plan. Still over half of the forest is now in the 61-90 age class with only 6% in each of the 0-30 and 121+ age classes. A goal to move towards a forest with a more even amount of area in each age class was set in the current plan, with relatively less area in the older age classes. One of the primary objectives in the current FMP is to reduce harvesting in certain age classes to allow more area to enter into the older age classes. SFMM was used to constrain harvest levels and calculate acceptable levels to achieve this objective.

In response to government initiatives, and problems created by over harvest of older age classes on the Sudbury Forest in the past, the planning team and the old growth task team developed an old growth strategy for the Sudbury Forest. This strategy provides a definition for old growth, describes old growth on the Sudbury Forest, and provides both landscape and stand level objectives and strategies. The strategy will be implemented via the current and subsequent forest management plans and will be evaluated via the report of past forest operations. See Appendix VIII of the 2005 FMP for the complete strategy.

Development of this strategy has been guided by MNR's old growth policy (2003), the *Old Growth Definitions for Ontario* (2003), and *Old Growth Conservation Requirements for Forest Management Planning* (Forest Management Planning Note) (Draft March, 2003).

2.6 Summary of Renewal, Tending and Protection Operations

Table 6 shows the amount of planned and actual renewal and maintenance for the two previous terms. Also shown is the planned and actual to date amount for the current term. The information for the 1990-1995 plan was provided by the Sudbury District MNR. The information for the 1995-2000 plan was obtained from the TMP and Annual Reports for the period. The planned 2000-2005 information was taken from the 2000 FMP. The actual was obtained from the 2004-2005 Annual Report. Planned information for the 2005 term was taken from FMP targeted forecasts. Actual data for the 2005-2006 silviculture program is not available for presentation in this report.

Prior to establishment of the Renewal Trust Fund in 1995 many Crown Management Units did not receive sufficient funding to complete all planned required silviculture work. Since 1995, when the Renewal Trust Fund and Special Purpose Accounts (for MNR Crown Management Units) were established, funding has increased and become more stable. For example, over the 1995 to 2000 period, tree planting has increased from approximately 800,000 seedlings/year to an average of 1.3 million/year.

The increase in targeted areas being artificially regenerated through planting from the 1995 plan to the 2000 FMP was the result of conversion off-site poplar, white birch and conifer mixed wood stands to white pine and red pine. This program ensured VFMs commitment to its objective in the 2000 plan to increase the amount of area in the white and red pine forest unit in an effort to make the overall forest composition more similar to pre-settlement times. Further increases in silviculture treatments are evident in Table 6 for the 2005 FMP, most likely due to the fact that FMP-25 in the current plan is based solely on model outputs – (assuming full utilization of the AHA) as well as the calculated forest renewal trust revenue. It is suspected that past forecasts have derived silvicultural figures tailored to historic utilization levels.

Many silviculture targets in the 2000-2005 FMP appear to fall short of forecasts made in the plan, however, reduction in harvest levels is the main factor in analyzing renewal numbers. A direct reflection of harvest reduction has been dipping silviculture levels. In addition to this reduction in harvest area, a trend in the 2000 term was to move away from site preparation to directly tree planting in cutovers continues to be evident in the low proportion of mechanical (43%) and chemical (37%) site preparation completed relative to forecast. Ground chemical site preparation was down because a large portion of allocated pine shelterwood, where this technique is commonly used, was not harvested. Aerial chemical site preparation was down because planting was done immediately following harvest in many cases, so the necessity and window for chemical site preparation was not there.

For the five-year term in general, Renewal Uneven-Aged Management and Even-Aged Management Natural Regeneration, AR-6 demonstrates tree-marking accomplishments only (not actual harvesting numbers). The

intention is to maintain AR-6 as the report of tree marking accomplishments on an annual basis, and AR-2 as the report of actual harvest areas for the same operating period. AR-7 has remained consistent with this approach for this report. However, new annual reporting submission requirements (November 15 for all reporting) will facilitate more accurate reporting of the prescribed natural regenerated areas – and will begin in the first year of reporting in the 2005-2010 FMP.

Areas scheduled for site preparation and regeneration are generally below target levels outlined by the FMP – primarily due to the reduction in harvest levels over the course of the FMP term.

Prescribed burns in Table 6 for the 1995 and 2000 plans refer to slash pile burning only. Prescribed burning for site preparation has not been undertaken on the Sudbury Forest given the operational and financial challenges of the treatment. For example, timing a prescribe burn to coincide with a good white and/or red pine cone crop under favourable burning conditions is next to impossible.

There have been no significant insect pest control operations on the Sudbury Forest over the three terms.

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

2004 Independent Forest Audit - Sudbury Forest

**Table 6 - SUMMARY OF RENEWAL, MAINTENANCE AND PROTECTION
Past and Current Plans**

	1990		1995		2000		2005	
	Planned ¹	Actual ²	Planned ³	Actual ⁴	Planned ⁵	Actual ⁶	Planned ⁷	Actual ⁸
Renewal								
Regeneration								
Uneven-Aged Management								
Modified Cuts in AOC's					123.0			
Selection Cut - Harvest	430.0	758.0	1,219.5	69.5	1,536.0	243.0	770.0	
Total Uneven-Aged Management	430.0	758.0	1,219.5	69.5	1,659.0	243.0	770.0	
Even-Aged Management								
Natural Regeneration								
Modified Cuts in AOC's					410.0			
Clearcut	6,530.0	3,285.0	5,650.0	282.9	6,657.0	3,914.0	8,890.0	
Strip Cut					21.0			
Seed Tree Cut	9,920.0	6,109.0	7,110.0	890.0	618.0		415.0	
Uniform Shelterwood Cut	3,670.0	4,660.0	10,325.0	2,874.6	10,059.0	6,575.0	8,652.0	
Plantation Marking								
CLAG					1,144.0		127.0	
Natural Natural	16,120.0	14,054.0	23,085.0	4,047.5	17,890.0	10,499.0	18,684.0	
Artificial Regeneration								
Planting	3,525.0	3,811.0	4,100.0	4,340.4	9,377.0	7,836.0		
Spr. of Trees (000's)								
Seeding	300.0	35.0	400.0	278.5	307.0		20,246.0	
With Site Preparation			950.0					
Scarification	280.0							
Natural Artificial	4,105.0	3,846.0	5,450.0	4,618.9	9,684.0	7,836.0	20,246.0	
Total Even-Aged Management	30,325.0	17,900.0	28,435.0	5,666.4	32,263.0	18,325.0	38,130.0	
Total Regeneration	30,655.0	18,658.0	29,754.5	8,725.0	33,142.0	18,568.0	39,100.0	
Site Preparation								
Mechanical	2,500.0	2,090.0	3,160.0	1,332.2	2,597.0	1,110.0	2,964.0	
Chemical (Aerial-Ground)	1,640.0	1,435.0	3,250.0	2,409.8	6,436.0	2,370.0	15,912.0	
Slash Piling				102.5			619.0	
Prescribed Burn	360.0	422.0	550.0	172.3	85.0	159.0		
Total Site Preparation	4,500.0	3,947.0	6,960.0	4,013.8	9,118.0	3,639.0	19,495.0	
Tending								
Cleaning								
manual	450.0	262.0	100.0	414.0	1,250.0	510.6	2,448.0	
chemical - ground	1,150.0	766.0	226.2	1,018.1	5,787.0	1,914.9	1,350.0	
- aerial		226.0	470.0	899.3	4,485.0	2,174.2	12,513.0	
mechanical								
prescribed burn								
Spacing, pre-commercial thinning, improvement cutting								
even-aged				300.0	100.0		945.0	
uneven-aged				80.0	522.0		185.0	
Cultivation	880.0	127.0						
Total Tending	2,480.0	1,321.0	786.2	2,211.4	12,044.0	4,598.5	17,641.0	
Protection (Insect Pest Control)								
accelerated harvest								
salvage								
manual protection								
ground insecticide		6.0						
aerial insecticide								
Total Protection		6.0						

¹ Source: Table RPEO-7 1990-1994 RPEO

² Source: Table RPEO-7 1994-1999 draft RPEO

³ Source: Table FMP-25 1999-2004 FMP

⁴ Source: Table AR-7 2003-2004 Ten Year Annual Report

⁵ Source: Table FMP-25 2004-2009 FMP

⁶ Source: Table AR-7 2004-2005 Annual Report

2.7 Summary of Regeneration

In Trend Analysis Table 7, the harvested area for the five-year period 1991 to 1996 has been reported and amounts to 15,576 ha. It is recommended in Appendix C of the IFAAP to use a 10-year delay from the end of the audit period (2006) in harvest area reported, to address the time lag that occurs prior to the point when regeneration is assessed for success. GIS records from VFM's database have been used to summarize information required in this table. As Appendix C outlines, survey areas are to correspond to the same areas recorded as harvested in the period between 1991-1996 – this is best accomplished with a spatial exercise in the GIS records. Figure 14 summarizes data presented in Table 7.

As the table outlines – total area harvested under an even-aged silvicultural system in the period was 15,177 ha, 35.6% of which has been surveyed for regeneration success. Of the surveyed area 4,945 ha were declared Free-to-Grow amounting to 91.4% success rate. It is important to note that approximately 3,300 ha of the total area harvested under an even-aged silvicultural system has had an overstorey update – but did not lend itself to regeneration establishment at time of survey. For instance – a shelterwood treatment that was surveyed, but no sufficient regeneration to report on – was updated in the overstorey but not as a fee-to-grow survey. In other cases, areas prescribed as clearcut treatments, only received first pass removal – leaving a mature, fully stocked stand not necessarily fitting to a regeneration survey. In these instances – composition, height and stocking updates were made to the inventory. Taking into account these areas, the total area unsurveyed from even-aged harvest between 1991 and 1996 is closer to 6441 ha. What should also be taken into consideration is lands designated by the Ministry as "class z" lands – backlogged area that the SFL must survey eventually, but is expected to take some time due to transition of the forest licence and all of it associated record keeping.

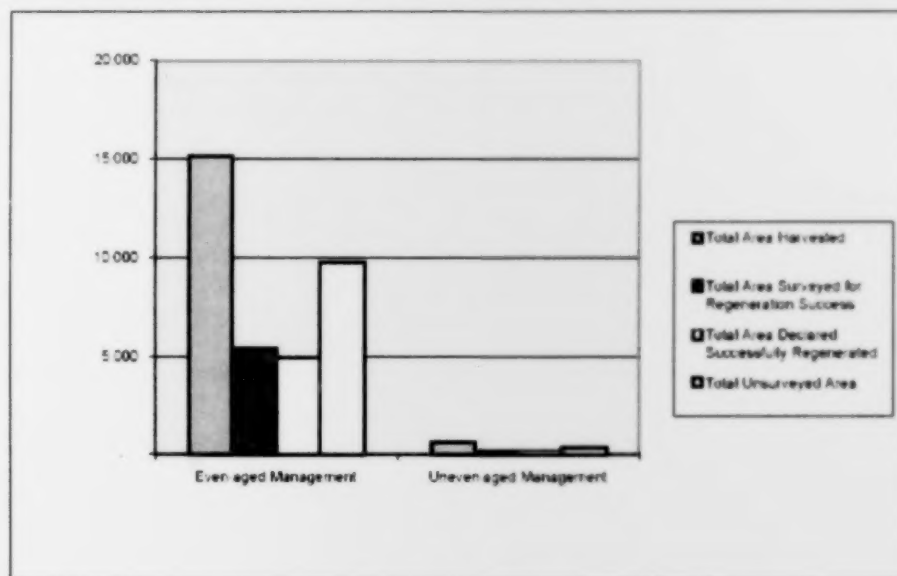
Total area harvested under uneven-aged silvicultural system in the period was 623 ha, 36% of which was surveyed for regeneration success. Of the surveyed area, 224 ha were declared Free-to-Grow amounting to 100.0% success rate.

FMP-28 Forecast of Assessment of Regeneration Success shows a total of 27,515 ha scheduled for assessment during the five-year FMP period, which equals the forecasted harvest area for that period. The actual harvest was 55% of that figure. Assessment totals for the 2000-2005 term approximate 12,000 ha, prioritising barren & scattered stands and conifer plantations. These areas were chosen so that those areas in need of further treatment to get back to a productive state could be identified, and to identify plantations that may have needed further tending. Hardwood natural regeneration areas received less attention because those areas reliably regenerate with little intervention following harvest. The result is a backlog in regeneration assessments in areas of natural hardwood regeneration.

Continuing the regeneration and silviculture effectiveness survey program throughout the 2005-2025 FMP is a high priority for the SFL. The development of data collection methodologies and procedure streamlining throughout the 2000-2020 FMP will result in efficient and effective regeneration monitoring into the future.

2006 Independent Forest Audit**Table 7 - Harvested Area Successfully Regenerated - Summary of All Forest Units**

	AREA IN HECTARES (All Forest Units Combined)	AREA IN HECTARES (All Forest Units Combined)
	Even-aged Management	Uneven-aged Management
Total Area Harvested	15,177	623
Total Area Surveyed for Regeneration Success	5,407	224
Total Unsurveyed Area	9,770	399
Total Area Declared Successfully Regenerated	4,945	224
Total Area Surveyed Not Successfully Regenerated	495	-
NSR	462	-
BIS	-	-
Not Available for Regen. (eg. Roads & Landings)	32	-
Other	3,296	-
Percent of Area Surveyed Declared Successfully Regenerated	91.4%	100.0%

**Source:**

total area harvested. TMPM Table 4.1, FMPM Table RPFO-2, or annual reports
survey results. TMPM Table 4.7, 1996 FMPM Table RPFO-8, RPFO-9, 2004 FMPM AR-7, AR-14, AR-16 and
silviculture records

Figure 14 Harvest Area Successfully Regenerated – Summary of All Forest Units.

3.0 2000-2005 Objectives and Strategies

At this time the first year of reporting for the current FMP term has not been completed, making it difficult to assess current objectives. The following section summarizes objective achievements for the Sudbury Forest 2000-2005 forest management plan, where measurable targets were present. In the absence of measurable targets, qualitative assessment of objective is provided.

3.1 Objectives Associated with Forest Diversity

1) Maintain a range of age classes over time in all forest units; approach a more balanced age class distribution for each forest unit.

As discussed previously with the trends of Table 5, it is difficult to assess achievement of objectives with intentions of being measured over a much longer period than 15 years – especially in light of the constantly changing forest unit classifications from plan to plan. It can be said with certainty however, that allocations on the landscape have followed the trends identified in the SFMM to equalize the range of age classes as much as possible.

2) Within 100 years, create a distribution of forest units more similar to that at the time of pre-logging and pre-fire suppression.

Rehabilitation initiative in Po, Bw, and Mr dominated forest units to restore 20%-30% back to original PW and PR forest units. Over 7,000 ha artificial regeneration was planted with red and white pine in the 2000-2005 term. Of this area, 1500 ha was planted Pw/Pr where Pw/Pr did not exist or was rare in the harvested stand. Approximately 3500 ha of this area was part of a large land reclamation project within the Sudbury Forest; planting densities in these areas averaged approximately 500 trees/ha.

3) Over the term of this plan, maintain an amount of old growth in all forest units over the entire forested landbase

Approximately 6% of the area in the Sudbury Forest is currently in the older age classes. Targets in the FMP speak of increasing the amount of area in the older age classes to 12% for the entire forested landbase by the year 2100. More specifically, increasing the amount of area in age classes greater than 120 years to 12% for the white and red pine forest unit group; and increasing the amount of area in age classes greater than 100 years to 12% for all forest units other than the white and red pine forest unit group.

Forest units have shifted to standard forest units in the 2005 FMP – making comparison difficult. New OLL Park and Protected Areas will protect the required representation.

4) Ensure that the hemlock working group on all Crown land continues to have area growing into the older age classes (>120 years old).

A goal to satisfy this objective was to maintain 12% of the area within the hemlock working group as older than 120 years. Hemlock Looper has damaged a significant portion of hemlock stands of all ages on the Sudbury Forest. Most of the damage is in Killarney Park and Whitefish Lake First Nation near Lake Panache as well as Tyson Lake. This damage is making it difficult to meet this objective. Strategies are in place (application for funding) to further quantify the damage and measure the impact on this objective.

5) Maintain the Forest Diversity Indices for forest units and age classes within the bounds of sustainability.

FMP-13 in the 2000 FMP illustrates that all indices fall within acceptable ranges for the beginning of the 2005 FMP – indicating that selected management alternative followed a sustainable direction for the 2000-2005 period in terms of Forest Diversity criteria.

6) Emulate natural wildfire disturbance patterns within the Sudbury Forest.

Plan harvest allocations to emulate fire disturbance as much as possible and provide a variety of harvest block sizes, including large clearcuts, which have natural breaks similar to what could be expected from wildfire (see Sections 10.2.1 and 10.2.2 in 2000 FMP). Planned harvest allocation show movement towards the natural template provided by the MNR.

3.2 Objectives Associated with Wood Supply

1) Produce a maximum sustainable supply of fibre for the wood using industries supplied by the Sudbury Forest on the available land base.

Targets set for timber production in the FMP were 185,000 m³ con/year and 120,000 m³ hwd/year, for a total volume output of 305,000 m³/year. Trends in Table 3 illustrate a total annual average volume harvested of close to 234,600 m³/year, with conifer totals approximately 78% of the target and hardwood totals approximately 38% of target. The primary reason for hardwood volume shortfalls is due to a continued absence of consistent markets for hardwood pulp from both tolerant and intolerant hardwood species.

2) Maintain the current economic contribution of the Sudbury Forest to the local economy.

Wood harvested on the Sudbury Forest maintained the local mills (within market restrictions). Majority of the silvicultural work performed during the planning term was carried out by local contractors (including local Aboriginal Contractors). VFM has a policy to purchase supplies & services locally.

3) Support efforts by the Municipality of French River to compensate for local jobs lost when Tembec's mill in Alban burned.

Red & white pine and white spruce sawlogs have been directed from Tembec's former Killarney /18 Mile Island Licence by the District Manager to the four Albans Mills.

4) Provide economic opportunities for First Nations members who live within or adjacent to the Sudbury Forest.

From 1999 through to 2005, adjacent First Nations communities benefited economically with multiple silviculture contracts on the Sudbury Forest. Included in the contracts were 775 ha of tree marking, 222 ha of cone collection, 5268 ha of artificial regeneration amounting to over 5,000,000 trees planted on the Sudbury Forest.

3.3 Objectives Associated with First Nation Social and Economic Development

1) Minimize the impact of forest operations on Aboriginal communities' traditional uses of the forest.

100% of Native communities in or adjacent to the management unit actively participated in the forest management planning process. VFM maintains open lines of communication with all First Nations with interests on the landbase.

3.4 Objectives Associated with Other Social and Economic Development

1) Protect cultural and spiritual values in the Sudbury Forest that are identified in the values mapping system.

Numerous Stage 1 and Stage 2 Archaeological surveys have been completed across the forest, in many cases the effected Aboriginal Community participated in the assessments. There were no instances of where a trespass into cultural heritage AOCs occurred. VFM and MNR encouraged Aboriginal Communities to continue to identify their values at any time during the implementation of the FMP.

3.5 Objectives Associated with the Provision of Forest Cover

1) Maintain preferred wildlife habitat for selected species within the bounds of sustainability.

Ensure that the area of habitat calculated for each selected wildlife species is within the bounds of sustainability (+ or – 20% of the highest and lowest levels) based on the SFMM results calculated for the Natural / Benchmark scenario. Considerations given to maintaining preferred wildlife habitat during the preparation of the 2005 FMP. Numerous wildlife AOC prescriptions included in the 2005 plan. The 2005 FMP was also the first plan to consider setting aside areas for martin habitat.

2) Provide for habitat for species which benefit from shoreline disturbance, such as beaver and mink.

Limited opportunity made available due to very few water bodies being surveyed and identified as warm water. Further work on this is continuing in the 2005 FMP.

3) Protect fisheries habitat in the Sudbury Forest.

AOC prescriptions to protect fish habitat and wetlands were applied as required in the FMP. Numerous updates to values information provided by VFM Staff.

4) Preserve the integrity of the Sudbury Forest for resource-based tourism at the landscape level and at the operational level.

VFM Inc. continues to engage in persistent consultation and negotiation with Resource Based Tourism (RBT) Operators resulting in 10 RSAs on the Sudbury Forest. The comprehensive AOC prescription development process contained the creation of the Forest Management Plan is open to all stakeholders and public with interests involving any aspect of the Sudbury Forest's landscape. Protocols to update values information in MNR database are used to generate values map at time of plan production, to keep the public informed of the planning team's current knowledge of specific values on the management unit.

3.6 Objectives Associated with Silviculture Practice

1) Deliver an effective silviculture program which will result in a continuous yield of forest crops of the species, quantity, and quality required by the wood-using industries for which the Sudbury Forest is a source of supply. In addition to the strategies listed below, the objective and strategy for producing a more balanced age class distribution (Section 3.3.1.1) also contributes to meeting this objective.

Silviculture targets for the 2000-2005 term include: Regenerating 32,284 ha of harvested area, 22,600 ha of this area by natural regeneration and 9,684 ha by artificial regeneration. In addition, harvest and regenerate 1,660 ha using a selection silviculture system. Conduct 12,645 ha of tending, including cleaning, spacing, pre-commercial thinning and improvement cutting. Regeneration efforts match or exceed the harvest level during the 2000-2005 term.

2) Increase the amount of higher value timber species and products, such as white pine and red pine sawlogs. In addition to the strategies listed below, the objective and strategies on species composition and increasing the amount of white pine and red pine on the Sudbury Forest also help achieve this objective (Section 3.3.1.2).

Three Forestry Futures Trust projects contributed to this objective. The first, a Pine Enhancement project restoring 165 ha of Po/Bw harvest area to Red Pine plantation. The second a Land Reclamation effort with 1,560,000 trees planted on Crown land barrens within City of Greater Sudbury 80% Pr, 10% Pw and 10% Sw, and finally the Red Pine Thinning project consisting of 1686 ha of treated area on the Sudbury Forest.

Objective Achievement Conclusions

It is every planning team's intention to achieve objectives set out in the strategic direction of the forest management plan; however, with so many variables to shift the predictive capability of forest modelling, some targets may not be met the way in which they were intended. These shifts can also obstruct the means in which we measure our successes (i.e. landbase fluctuations, forest unit and yield curve development). The planning team, in the preparation of the 2005 FMP recognized and addressed a number of areas for improvement. Benefits of this trend analysis and the 2006 independent forest audit will certainly be used as a tool for the 2010 Sudbury Forest Management Planning Team.

4.0 Assessment of Forest Sustainability

Reference is made in Appendix C to Criteria 7.4 of the 2006 IFA Process and Protocol and speaks to the requirement of reviewing forest sustainability trends using evidence provided in previous RPFOs. As mentioned in the introduction of the report, the 2004-2005 ten-year report for the Sudbury Forest has been completed for the term in accordance with the phase-in requirements of the 2004 FMPM, and provides insight regarding the sustainability of management practices on the Forest. The following text has been summarized from the ten-year report and explores the forest sustainability trends as of 2005.

The 1996 FMPM (Section 4.3) details that five forest sustainability criteria in particular, are to be considered when assessing the sustainability of a forest management plan. These are summarized in Figure C-1, and include:

- Biodiversity
- Forest Condition and Ecosystem Productivity
- Multiple Benefits to Society
- Soil and Water Conservation
- Accepting Society's Responsibility for Sustainable Development

For each of the five criteria the FMPM has outlined measurable indicators used to guide the forest management process – allowing the planning team to quantify the current forest condition in order to assess management alternatives and their potential effect on the forest's current state. The indicators fall into the following categories and measured in the remaining tables in this report:

- Managed Crown Forest Area Available for Timber Production
- Landscape Pattern or Forest Diversity Indices
- Habitat for Selected Wildlife Species
- Forest Productivity
- Percent of Available Harvest Area which is Actually Utilized/Multiple Benefits to Society

4.1 Managed Crown Forest Area Available for Timber Production

A summary of managed forest area available for timber production is illustrated in the 2004-2005 Year Ten Annual Report (Table RPFO-15). Meaningful results are difficult to extract from the provided information, as the purpose of this table is to analyze multiple planning terms over a longer period of time. What can be noted from the information on this table, is a loss in area available for timber production. This table shows that the selected course of action for this management plan would decrease the available forest from 398,168 ha to 379,011 ha, decrease rationalized by accumulating reserves, and roads and landings, and is typical of other forests being managed in Ontario.

When the 2000 FMP was written, Table FMP-3 showed that there were 398,168 ha available for timber production and it was projected that this would decrease to 379,011 ha by 2100; that would have been a 23,157 ha decrease over 100 years. The forest available for timber production has increased in the 2005 Forest Management Plan due to the addition of approximately 50,000 ha from the Spanish Forest Management Unit, making meaningful results impossible looking at the future forest condition. This addition coupled with the withdrawal of formal OLL processes, has resulted in a landbase growth on the Sudbury Forest. The social, economic and environmental aspects of sustainability require that the amount of area the managed landscape to be balanced to achieve the desired level of benefits from the forest. This will be better determined in following reports for coming management cycles.

4.2 Landscape Pattern or Forest Diversity Indicators

Landscape pattern indices and forest diversity indices serve as indicators of biodiversity and wildlife habitat. Analytical models use these indices to express variety in forest structure, pattern, and composition. The data

contained within the 2004-2005 Year ten report is intended to be built over successive plan terms to show trends over time to provide some insight into the changing index levels. As this is the first plan term being reported, there is little data to compare or assess.

The landscape metrics, predicted by the model are to remain within acceptable ranges of variation of selected management alternative. The figures report on the predicted values in the 2000 FMP, and the actual values that were calculated in the 2005 FMP for the current forest condition. The non-spatial measure of forest units, being the Shannon Weiner, the Simpson's and the Shannon Evenness Indexes are all within the acceptable levels at the completion of the 2000-2005 term.

The overall change in landscape pattern is considered acceptable. Landscape pattern is an indicator of biodiversity that describes the composition and configuration of a landscape. Composition refers to the presence and amount of any one particular patch type, while configuration refers to the spatial arrangement of those associated areas of patches. These values will serve as important benchmark information to further our understanding of landscape pattern and landscape pattern change in the future.

4.3 Habitat for Selected Wildlife Species

Habitat supply for these wildlife species listed in the table was modeled non-spatially using OMNR's Strategic Forest Management Model (SFMM). There is no single measure that can tell us whether a forest is being managed sustainability, but carefully selected species can be a valuable indicator of whether forest management is proceeding on a sustainable course, from the perspective of providing habitat for wildlife.

The habitat supply for the selected species is documented in the report, showing the habitat that was predicted in the 2000 FMP, and also the actual habitat calculated at the start of the 2005 FMP.

As this is the first plan term being reported for the Sudbury Forest designed by the 1996 FMPM standard, there is little data to assess for trends. Table FMP-5 in the current (2005) FMP shows how habitat has changed from last term and how it is expected to change over the 100-year modelling period. Some changes since last term appear quite large, but most of the changes can be attributed to inventory updates since the last plan. There were 30,000 ha depleted due to harvest activity over the last five years, area added as a result of free-to-grow surveys, and an update in the area treated with the selection and shelterwood systems. In addition, the wildlife habitat matrices in SFMM have been updated, as has the method for calculating ecosite in SFMMTool. The differences between planned and actual amounts of habitat could likely be reflecting differences in the habitat types identified as "preferred" for these wildlife species in MNR's old and new habitat matrices.

Habitat levels increase over the next 100 years for 14 of the habitat types, and there is a decrease in five habitat types, four of which consistently increase in the long term projections. Section 2.2.4.1 in the 2005 FMP describes wildlife on the Sudbury Forest in more detail, as does Section 10.1, where strategies to protect wildlife habitat are discussed.

4.4 Forest Productivity

Landscape processes of evapo-transpiration, water runoff and net carbon assimilation can be summarized through values for net primary productivity and water yield, and serve as measurable indicators for the forest sustainability criteria of Forest Condition and Ecosystem Productivity and Water Conservation, respectively.

Carbon dioxide is used and produced by photosynthesizing plants. The extent to which the rate of carbon used exceeds carbon given off (net canopy carbon assimilation) is a measure of net primary productivity, and is expressed in kg of Carbon / ha / year. The model RHESSys (Regional Hydro Ecological Simulation System) was used which is a landscape level data processing and simulation system for estimating forest carbon and water cycling.

Water yield is a function of two major variables: evapo-transpiration and runoff. Water yield is directly affected by the amount of watershed area clearcut or burned within the last 10 years. Due to the relatively extensive amount of selection and shelterwood harvesting in the Sudbury Forest, only 3.2% of the area within the second order stream watersheds has been disturbed by clearcut or fire within the last 10 years. This figure was calculated by dividing the net disturbed area originating within the past 10 years into the total area within the boundaries of the second order watersheds regardless of ownership type. An increase of 0.5% is noted from the previous FMP figure of 2.7%.

4.5 Percent of Available Harvest Area which is Actually Utilized / Multiple Benefits to Society

Total Productive Crown Forest managed in the 2000-2005 period totalled 406,728 ha and has increased since, to a total of 447,855 ha in the 2005 forest management plan. Many of the same contributing factors as identified in section 2.1 analysis have contributed to this increase – however the major factor being change in ownership from plan to plan.

As highlighted in other sections of this report, utilization on the forest could be improved from its current 50% overall figure. Values in this table are rationalized much the same way as in sections 2.3 and 2.4.

Of the native communities on or adjacent to the Sudbury Forest, all participate to a great extent in the forest management planning process.

The model SEIM was re-run by MNR using the actual volumes harvested (data from Table AR-5), during the term of the plan to determine that the total added value is approximately 27 million/year. MNR has also indicated that the Local Citizen's Committees self-evaluation of their effectiveness has scored a ?? (Waiting for MNR value) out of 10.

4.6 Conclusion

Using the available information applied in this report, indication that the Sudbury Forest has been and continues to be managed in a sustainable manor. Most analysis performed in historic documents is aspatial in nature, and therefore is limited in its accuracy to determine shortfalls. Using developing spatial techniques and the accumulation of GIS information – the future of assessing sustainability will be more robust in its conclusions. In spite of their aspatial nature– the indicators of sustainability do not reveal any excessive variation.

APPENDIX 1

Table 5a, 5b, 5c and 5d

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

2006 Independent Forest Audit - Sudbury Forest

**Table 5a - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT
2005-2010 FMP**

Forest Unit	Age Class	Protection Forest		Production Forest				
		(ha)	(m ³)	Unavailable		Stage of Management	Available	
				(ha)	(m ³)		(ha)	(m ³)
BW	B&S						4724.33	
	1-20						407.28	0
	21-40			0.08			2979.59	44693.85
	41-60	1410.92		8.88			11886.89	558683.83
	61-80	774.35		118.73			32991.56	2474367
	81-100	181.28	16133.92	76.86	0		4592.78	408757.42
	101-120	33.43	2908.41		0		912.49	79386.63
	121-140		0		0		169.96	13256.88
	141-160		0		0			0
	161-180		0		0			0
	181-200		0		0			0
	201+		0		0			0
		2399.98	19042.33	204.55	0	0	58664.88	3579145.61
MW1	B&S						178.75	
	1-20			0.53			298.11	0
	21-40			0.59	14.16		3124.38	74985.12
	41-60	267.24		29.06	1801.72		6830.95	423518.9
	61-80	934.69		371.06	33395.4		27701.89	2493170.1
	81-100	168.4	18187.2	153.97	16628.76		7571.11	817679.88
	101-120		0	7.13	720.13		1374.38	138812.38
	121-140		0		0		73.03	4260.336504
	141-160		0		0		19.41	795.81
	161-180		0		0			0
	181-200		0		0			0
	201+		0		0			0
		1370.33	18187.2	562.34	52560.17	0	47172.01	3953222.527
MW2	B&S						46.48	
	1-20						25.3	0
	21-40			1.02			4275.96	81243.24
	41-60	21.86		25.61			6403.8	332997.6
	61-80	570.48		136.22	12123.58		15352.46	1366368.94
	81-100			34.67	3952.38		7772.79	886098.06
	101-120		0	24.22	2850.18054		4116.46	484420.073
	121-140		0	0.92	76.36		729.21	60524.43
	141-160		0		0		98.01	6370.65
	161-180				0		36.87	2285.94
	181-200				0			0
	201+				0			0
		592.34	0	222.67	19062.5005	0	38857.34	3220308.933
PJ	B&S						7721.97	0
	1-20	9.8		24.21	217.89		1892.68	17034.12
	21-40	15.67	1034.22		0		884.97	58408.02
	41-60	105.68	13527.04		0		1507.61	192974.08
	61-80	124.61	20809.87	66.77	11150.59		11574.57	1932953.19
	81-100	77.9	14022	190.86	34354.8		3587.41	645733.8
	101-120		0	3.54	601.8		356.3	60571
	121-140		0	3.13	447.59		174.62	24970.66
	141-160		0		0		125.59	13563.72
	161-180		0		0			0
	181-200		0		0			0
	201+		0		0			0
		333.66	49393.13	288.51	46772.67	0	27825.72	2946208.59

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

PJSB	B&S						278.28	0
	1-20			8.29	41.45		1684.89	8424.45
	21-40				0		1322.92	63500.16
	41-60	33.9			0		4300.92	412888.32
	61-80	970.1		475.28	59885.28		29052.52	3660617.52
	81-100	301.54		470.51	63048.34		14273.94	1912707.96
	101-120	124.06	15383.44	49.53	6141.72		3787.83	469690.92
	121-140		0	3.6	356.4		923.75	91451.25
	141-160		0		0		233.64	17289.36
	161-180		0		0			0
	181-200		0		0			0
	201+		0		0		77.04	1155.6
		1429.6	15383.44	1007.21	129473.19	0	55935.73	6637725.54
PO	B&S						6077.09	0
	1-20	11.5					593.23	3559.38
	21-40	60.46		1.9			2080.79	91554.76
	41-60	327.93			0		3916.71	352503.9
	61-80	441.31	52957.2	79.25	9510		17326.88	2079225.6
	81-100	101.57	13000.96	35.73	4573.44		3722.28	476451.84
	101-120	3.43	415.03	31.06	3758.26		441.52	53423.92
	121-140		0		0			0
	141-160		0		0			0
	161-180		0		0			0
	181-200		0		0			0
	201+		0		0			0
		946.2	66373.19	147.94	17841.7	0	34158.5	3056719.4
PR	B&S						2631.47	0
	1-20			1			77.65	232.95
	21-40				0		1030.05	110215.35
	41-60						305.54	62330.16
	61-80						66.97	17412.2
	81-100						89.9	25351.8
	101-120						168.01	47042.8
	121-140							0
	141-160							0
	161-180							0
	181-200							0
	201+							0
		0	0	1	0	0	4369.59	262585.26
PWST	B&S						2851.07	0
	1-20			0.47			400.28	5203.64
	21-40				0		2643.96	134841.96
	41-60	178.22		12	1104		2763.17	254211.64
	61-80	264.03		66.62	8327.5		4962.06	620257.5
	81-100		0	63.7	9363.9		5079.72	746718.84
	101-120	37.7	6107.4	58.3	9444.6		3487.05	564902.1
	121-140		0	41.04	7017.84		1405.68	240371.28
	141-160		0	15.4	2725.8		518.28	91735.56
	161-180	36.53	6429.28	6.3	1108.8		225.87	39753.12
	181-200		0		0		48.3	8597.4
	201+		0		0		144.54	25294.5
		516.48	12536.68	263.83	39092.44	0	24529.98	2731887.54

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

SBLC	B&S						3886.52	0
	1-20							0
	21-40						10.46	115.06
	41-60			1.74			395.5	19775
	61-80			2.74			1308.65	119087.15
	81-100			21.95			2064.01	243553.18
	101-120	24.33		32.12	4015		2313.89	289236.25
	121-140			23.03	2786.63		393.1	47565.1
	141-160				0		21.93	2368.44
	161-180				0			0
	181-200				0			0
	201+		0		0			0
		24.33	0	81.58	6801.63	0	10394.06	721700.18
SF	B&S						2831.37	0
	1-20				0		366.59	0
	21-40	17.68			0		2974.97	68424.31
	41-60	136.17	8851.05		0		7172.86	466235.9
	61-80	109.22	9611.36	145.33	12789.04		10973.82	965696.16
	81-100	9.4	930.6	265.88	26322.12		17111.91	1694079.09
	101-120		0	113.43	11343		9235.12	923512
	121-140		0	63.58	5976.52		1392.13	130860.22
	141-160		0		0		154.58	13293.88
	161-180		0		0			0
	181-200		0		0		14.32	916.48
	201+				0			0
		272.47	19393.01	588.22	56430.68	0	52227.67	4263018.04
CE	B&S						410.67	0
	1-20							0
	21-40							0
	41-60						23.2	376.65432
	61-80						107.54	5323.455834
	81-100						515.05	41601.82462
	101-120			3.06			1204.6	111759.897
	121-140	22.7		35.58			319.69	26812.71999
	141-160						284.93	21213.72233
	161-180							0
	181-200				0			0
	201+				0			0
		22.7	0	38.64	0	0	2865.68	207088.2741
HDUS	B&S		0		0		212.59	0
	1-20		0		0		31.92	0
	21-40		0		0		323.59	1941.54
	41-60	269.82	5936.04	0.62	13.64		1972.17	43387.74
	61-80	1124.56	52050.26	0	0		3745.87	173377.593
	81-100	35.17	2004.69	2.45	139.65		799.18	45553.26
	101-120		0	0	0		353.14	22247.82
	121-140		0		0		173.47	11047.24613
	141-160		0	3.83	214.48		54.71	3063.76
	161-180		0		0		43.35	2080.8
	181-200		0		0			0
	201+		0		0			0
		1429.55	59990.99	6.9	367.77	0	7709.99	302699.7591

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

HE	B&S		0		0		0
	1-20		0		0		0
	21-40		0		0		0
	41-60		0		0		0
	61-80		0		0	85.83	10642.92
	81-100	66.92	11376.4		0	401.5	68255
	101-120	26.22	5034.24	0.09	17.28	972.46	186712.32
	121-140	12.26	2376.2173		0	322.95	62593.74917
	141-160	152.37	28340.82		0	127.59	23731.74
	161-180		0		0	27.75	5050.5
	181-200		0		0	51.25	9173.75
	201+		0		0		0
		257.77	47127.677	0.09	17.28	0	1989.33
							366159.9792
LVMX	B&S		0			98.07	0
	1-20		0		0		0
	21-40		0		0		0
	41-60	92.08	3959.44		0	157.97	6792.71
	61-80	24.39	2097.54	11.48	987.28	586.27	50419.22
	81-100		0		0	274.36	31551.4
	101-120		0		0	203.82	25477.5
	121-140	1.2	122.4		0	79.74	8133.48
	141-160		0		0	61.85	5875.75
	161-180		0		0	98.12	9223.28
	181-200		0		0		0
	201+		0		0		0
Forest Unit Subtotal		117.67	6179.38	11.48	987.28	0	1560.2
							137473.34
PWUS	B&S					4466.28	0
	1-20			19.19	249.47	909.89	11828.57
	21-40				0	5951.47	374942.61
	41-60	29.02			0	3781.1	427264.3
	61-80	366.08	55644.16	72.21	10975.92	11032.18	1676891.36
	81-100	528.91	94145.98	579.39	103131.42	23400.24	4165242.72
	101-120		0	179.11	35822	14891.69	2978338
	121-140	20.92	4455.96	73.77	15713.01	3989.28	849716.64
	141-160		0	1.77	387.63	1601.59	350748.21
	161-180		0		0	169.76	37347.2
	181-200		0		0		0
	201+		0		0	257.36	54560.32
Forest Unit Subtotal		944.93	154246.1	925.44	166279.45	0	70450.84
							10926879.93
HDSEL	All ages	224.39		0.65		0	4792.74
Forest Unit Subtotal		224.39	0	0.65	0	0	4792.74
							431346.6
Total		9937.47	313607.03	3425.6	369347.311	0	443504.26
							112284644.2

Source:

Source: Table FMP-9 2005-2010 FMP.

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

2006 Independent Forest Audit - Sudbury Forest

Table 5b - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT (FMP-9)

2000-2005 FMP

Excludes Crown wood on Patent Land

Forest Unit	Age Class	Protection Forest		Production Forest					
		(ha)	(m3)	Unavailable		Stage of Management	Available		
				(ha)	(m3)		(ha)	(m3)	
Pj-cc	B&S			218.2			4,145.9		
	1-20	139.0		97.9	191		1,860.2	3,624	
	21-40			102.0	4,707		1,938.3	89,437	
	41-60	188.8		246.3	20,386		4,680.1	387,331	
	61-80	1,254.4		1,371.1	146,541		26,051.8	2,784,281	
	81-100	194.8		594.4	75,770		11,293.0	1,439,636	
	101-120	123.7		66.2	6,688		1,257.4	127,077	
	121-140			28.0	1,864		531.9	35,417	
	141-160			3.8	90		72.9	1,718	
	161-180								
	181-200								
	201+			3.8	96		73.1	1,826	
	Forest Unit Subtotal	1,900.7		2,731.8	256,334		51,904.5	4,870,347	
MixCon-cc	B&S			83.3			1,583.3		
	1-20			48.2	380		914.9	7,219	
	21-40	68.6		404.6	14,146		7,686.7	268,778	
	41-60	740.0		949.2	61,255		18,035.0	1,163,848	
	61-80	654.6		1,306.3	104,550		24,819.4	1,986,457	
	81-100	206.1		810.8	86,123		15,405.9	1,636,337	
	101-120	3.6		403.6	39,978		7,668.3	759,582	
	121-140			88.3	8,127		1,676.9	154,416	
	141-160			24.6	1,633		466.9	31,035	
	161-180	36.5		9.6	584		182.2	11,089	
	181-200			0.7	52		13.6	962	
	201+			5.4	396		103.3	7,521	
	Forest Unit Subtotal	1,709.4		4,134.5	317,225		78,556.4	6,027,273	
MixCon-us	B&S			69.0	474	Prep Seed	1,310.6	9,012	
	1-20			452.0	14,059	Prep Seed	8,588.8	267,118	
	21-40			538.1	37,339	Prep Seed	10,224.6	709,441	
	41-60	82.6		852.7	79,502	Prep Seed	16,200.6	1,510,546	
	61-80	233.1		1,079.3	146,974	Prep Seed	20,506.3	2,792,503	
	81-100	53.3		446.9	62,768	Prep Seed	8,490.3	1,192,594	
	101-120	20.9		129.8	14,955	Prep Seed	2,465.8	284,154	
	121-140			58.8	7,867	Prep Seed	1,116.6	149,482	
	141-160			17.3	1,834	Prep Seed	329.6	34,850	
	161-180			5.7	745	Prep Seed	108.6	14,151	
	181-200			11.7	1,219	Prep Seed	221.4	23,163	
	201+								
	Stage of Management Subtotal	389.9		3,661.2	367,738		69,563.3	6,987,014	
MixCon-us	B&S								
	1-20								
	21-40								
	41-60								
	61-80			2.5	288	First Removal	46.6	5,466	
	81-100			15.1	2,350	First Removal	287.1	44,656	
	101-120			14.6	1,959	First Removal	277.4	37,220	
	121-140			0.0	4	First Removal	0.7	80	
	141-160								
	161-180								
	181-200								
	201+								
	Stage of Management Subtotal			32.2	4,601		611.7	87,423	
MixCon-us	B&S								
	1-20								
	21-40								
	41-60								
	61-80								
	81-100								
	101-120								
	121-140								
	141-160								
	161-180								
	181-200								
	201+								
	Stage of Management Subtotal								
	Forest Unit Subtotal	389.9		3,693.4	372,339		70,175.0	7,074,437	

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

Hd_sel	B&S			0.1		115.3	
	1-20			11.7	312	221.8	5,928
	21-40			25.4	1,793	481.8	34,074
	41-60			84.1	10,665	1,597.9	202,644
	61-80	43.7		144.3	20,237	2,742.2	384,511
	81-100	96.9		94.5	14,279	1,795.7	271,306
	101-120	26.2		36.5	5,301	693.0	100,711
	121-140			19.6	3,443	372.4	65,425
	141-160			8.0	610	152.2	11,581
	161-180						
	181-200						
	201+						
	Forest Unit Subtotal	136.8		430.1	56,641	8,172.4	1,076,181
Hd-us	B&S			25.0	First Removal	474.5	
	1-20			4.4	13	82.7	248
	21-40			64.1	1,098	1,217.2	20,838
	41-60	21.4		163.2	11,841	3,100.6	224,987
	61-80	157.9		125.6	13,771	2,386.2	261,642
	81-100	29.3		31.5	3,651	599.0	109,361
	101-120			9.4	1,220	179.5	23,186
	121-140	27.0		11.8	1,405	224.3	26,695
	141-160			6.6	435	125.1	8,261
	161-180			2.2	241	41.2	4,577
	181-200						
	201+						
	Stage of Management Subtotal	235.8		443.7	33,674	8,430.4	639,815
Hd-us	B&S						
	1-20						
	21-40						
	41-60						
	61-80			0.6	29	10.9	557
	81-100			4.9	378	92.2	7,188
	101-120			0.6	48	11.6	904
	121-140						
	141-160						
	161-180						
	181-200						
	201+						
	Stage of Management Subtotal			6.0	455	114.7	8,649
	Forest Unit Subtotal	235.8		449.7	34,130	8,545.1	648,464
Low Mix-cc	B&S			19.5		369.7	
	1-20			0.7	6	12.4	112
	21-40			1.6	5	30.1	90
	41-60			59.3	3,312	1,127.1	62,932
	61-80	28.5		157.0	11,901	2,983.9	256,131
	81-100			168.3	15,261	3,197.8	289,930
	101-120	10.0		106.7	9,398	2,027.9	178,567
	121-140	23.4		40.0	2,780	760.9	52,824
	141-160			6.1	451	116.8	8,563
	161-180						
	181-200						
	201+						
	Forest Unit Subtotal	61.9		559.3	43,113	10,626.7	819,149
PwOakHd-us	B&S			3.3	Prep. Seed	62.6	
	1-20			35.2	616	669.1	11,697
	21-40			204.8	9,465	3,890.7	179,820
	41-60	226.0		272.1	21,507	5,170.1	408,638
	61-80	968.0		153.6	21,776	2,918.1	413,752
	81-100	18.1		28.3	4,089	537.1	77,698
	101-120						
	121-140						
	141-160	139.6					
	161-180						
	181-200						
	201+						
	Stage of Management Subtotal	1,351.7		697.3	57,453	13,247.8	1,091,611
PwOakHd-us	B&S						
	1-20						
	21-40						
	41-60						
	61-80			0.5	22	10.4	414
	81-100			13.8	975	263.0	18,534
	101-120			3.5	381	67.1	7,244
	121-140			9.8	942	186.4	17,893
	141-160						
	161-180						
	181-200						
	201+						
	Stage of Management Subtotal			27.7	2,320	526.8	44,085
	Forest Unit Subtotal	1,351.7		725.0	59,773	13,774.5	1,135,696

Comparison and Trend Analysis of Planned vs. Actual Forest Operations – Sudbury Forest

PoBw Mix-cc	B&S			188.9		7,388.0	
	1-20			72.9	205	1,385.5	3,900
	21-40	73.3		314.4	9,538	5,973.0	181,223
	41-60	1,409.1		1,160.0	77,405	22,040.6	1,470,687
	61-80	1,122.4		1,706.4	153,961	32,420.9	2,925,266
	81-100	29.9		280.1	29,675	5,322.4	563,821
	101-120	51.3		39.1	3,927	742.1	74,618
	121-140			1.4	106	26.7	2,014
	141-160						
	161-180						
	181-200						
	201+						
Forest Unit Subtotal		2,686.0		3,963.1	274,817	76,209.2	5,221,536
PoPr-us	B&S			132.7		2,520.7	
	1-20			5.7	85	107.9	669
	21-40			119.1	3,954	2,262.1	75,132
	41-60			54.1	1,817	1,027.9	72,824
	61-80	5.9		119.3	12,342	2,267.2	234,498
	81-100	38.7		376.1	56,870	7,146.4	1,080,536
	101-120	39.1		156.3	25,247	2,970.5	479,607
	121-140			26.9	3,731	510.2	70,880
	141-160			19.6	2,718	373.1	51,645
	161-180						
	181-200						
	201+						
Stage of Management Subtotal		83.9		1,069.8	108,714	19,185.9	2,065,575
PoPr-us	B&S						
	1-20						
	21-40						
	41-60						
	61-80			12.4	954	235.2	38,123
	81-100			89.1	8,295	1,692.6	157,062
	101-120			72.4	7,187	1,375.1	136,536
	121-140			15.5	1,323	295.2	25,129
	141-160						
	161-180			0.4	17	8.3	694
	181-200						
	201+						
Stage of Management Subtotal				189.8	17,795	3,606.4	338,164
Forest Unit Subtotal		83.9		1,199.6	126,509	22,792.3	2,403,679
Sh-cc	B&S			134.6		2,556.5	
	1-20			2.9	12	54.8	219
	21-40			68.0	1,931	1,292.3	36,693
	41-60			894.0	22,677	5,775.7	519,462
	61-80			569.3	63,124	10,817.2	1,190,358
	81-100			640.5	70,487	12,170.4	1,339,251
	101-120	4.3		233.8	25,731	4,441.9	488,888
	121-140			63.2	6,764	1,280.6	128,509
	141-160			5.5	301	104.6	5,725
	161-180						
	181-200						
	201+						
Forest Unit Subtotal		4.3		2,021.8	198,427	38,413.9	3,618,106
Total All Forest Units		8,560.4		19,908.4	1,731,309	378,259.9	32,894,862

Source: Table FMP-9 2000-2005 FMP

Note: Unavailable area and volume is an estimate based on estimated losses to accumulating reserves (i.e. shoreline and wildlife reserves). The sum of this available and unavailable area is identified as the productive forest area in tables FMP 1, 3 and 11.

2006 Independent Forest Audit - Sudbury Forest

TABLE 5c - SUMMARY OF MANAGED PRODUCTIVE FOREST BY FOREST UNIT FOR THE 1995-2000 TMP

Excludes Crown wood on Patent Land

Forest Unit	Age Class	Protection Forest		Production Forest			
		(ha)	(m3)	Unavailable		Stage of Management	Available
				(ha)	(m3)		(ha) (m3)
B	B & S						381
	1-20						48
	21 - 40						5,961
	41-60						6,751
	61-80						3,218
	81 - 100						6,317
	101 - 120						419
	121 - 140						45
	141 -						
	TOTAL						23,140
MXS	B & S						555
	1-20						1,081
	21 - 40						2,679
	41-60						4,966
	61-80						6,334
	81 - 100						6,023
	101 - 120						2,126
	121 - 140						662
	141 -						
	TOTAL						24,426
OHE	B & S						80
	1-20						358
	21 - 40						4,002
	41-60						10,304
	61-80						6,178
	81 - 100						888
	101 - 120						241
	121 - 140						212
	141 -						148
	TOTAL						22,411
PO	B & S						3,758
	1-20						3,422
	21 - 40						4,351
	41-60						23,307
	61-80						30,723
	81 - 100						3,269
	101 - 120						928
	121 - 140						29
	141 -						
	TOTAL						69,787
SB	B & S						193
	1-20						2,301
	21 - 40						11,134
	41-60						14,777
	61-80						18,525
	81 - 100						3,642
	101 - 120						794
	121 - 140						
	141 -						
	TOTAL						51,366
THU	B & S						172
	1-20						243
	21 - 40						917
	41-60						2,428
	61-80						2,050
	81 - 100						743
	101 - 120						318
	121 - 140						57
	141 -						
	TOTAL						6,928

BW	B & S					2,566	
	1-20					490	
	21 - 40					7,599	
	41-60					35,917	
	61-80					22,470	
	81 - 100					7,024	
	101 - 120					1,254	
	121 - 140					214	
	141 +					16	
	TOTAL					77,550	
OC	B & S					77	
	1-20						
	21 - 40					35	
	41-60					386	
	61-80					1,055	
	81 - 100					4,711	
	101 - 120					2,631	
	121 - 140					901	
	141 +					686	
	TOTAL					10,482	
PJ	B & S					1,706	
	1-20					174	
	21 - 40					2,648	
	41-60					10,699	
	61-80					40,168	
	81 - 100					6,901	
	101 - 120					2,415	
	121 - 140					767	
	141 +					84	
	TOTAL					65,562	
PWR	B & S					4,464	
	1-20					3,371	
	21 - 40					5,691	
	41-60					5,224	
	61-80					12,688	
	81 - 100					30,335	
	101 - 120					9,977	
	121 - 140					4,550	
	141 +					1,773	
	TOTAL					78,073	
SBW	B & S					623	
	1-20						
	21 - 40					35	
	41-60					219	
	61-80					152	
	81 - 100					458	
	101 - 120					271	
	121 - 140					114	
	141 +						
	TOTAL					1,872	
All	B & S					14,210	
	1-20					9,309	
	21 - 40					35,545	
	41-60					109,824	
	61-80					140,191	
	81 - 100					86,501	
	101 - 120					24,647	
	121 - 140					8,606	
	141 +					2,764	
	Grand Total					431,597	

Source: Table 4.13.1 1995-2000 TMP

Note: Data available for age class by forest unit only.

2006 Independent Forest Audit - Sudbury Forest**Table 5d - SUMMARY BY TOTAL AGE CLASS STRUCTURE FOR MANAGED PRODUCTIVE FOREST****Past and Current Plans**

	<i>All Forest Units</i>			
	Past Plans			Current
	1990-1995¹	1995-2000²	2000-2005	2005-2010
B&S/NSR	95,350	14,210	19,217	36,415
1-20	19,424	9,309	6,398	6,688
21-40	10,940	35,545	33,101	27,603
41-60	24,726	109,824	71,664	51,418
61-80	159,849	140,191	122,766	166,869
81-100	73,651	86,501	81,255	91,256
101-120	39,955	24,647	31,305	43,819
121+ / 121-140	27,509	8,606	8,573	10,147
141+ / 141-160		2,764	2,748	3,302
161-180			561	602
181-200			274	114
200+			398	479
Total	451,404	431,597	378,260	438,712

Source: Table 5c

Source: Table 5b

Source: Table 5a

Appendix B

Audit Team Members and Qualifications

Name	Role	Responsibilities	Credentials
Mr. Peter Higgelke	Lead Auditor	<ul style="list-style-type: none"> Overall audit coordination Oversee activities of audit team members Review requirements and contractual obligations Lead review of achievement of management objectives and forest sustainability Lead audit report preparation 	R.P.F. M.Sc.F.; 27 years forestry experience in Ontario, Quebec, and Germany; Lead Auditor for one Independent Forest Audit, Wildlife Auditor on one Forest Management Agreement (FMA) Review and six Independent Forest Audits, and as a Forestry Auditor on five previous Independent Forest Audits.
Mr. Dave Thomson	Forest Management Planning Auditor and Secretariat	<ul style="list-style-type: none"> Planning requirements related to public participation and planning team activities Assist in assessment of achievement of management objectives and forest sustainability Coordinate document distribution and logistics and audit report preparation 	R.P.F.; 28 years of forestry and resource management experience in Ontario and Manitoba; certified environmental auditor with the Quality Management Institute; completed ISO 14001 lead-auditor training; Audit Secretariat and/or Planning Auditor on five Independent Forest Audits; Auditor or Lead Auditor (in training) on three environmental or forest certification audits.
Ms. Gabriele Aleksa	Silviculture Operations Auditor	<ul style="list-style-type: none"> Assess silvicultural planning and operations Assist in assessment of achievement of management objectives and forest sustainability 	R.P.F.; 25 years experience in natural resource management; resource stewardship agreement (RSA) consultant; audited private land harvesting practices for litigation purposes; auditor on one Independent Forest Audit.
Mr. Al Corlett	Harvesting Operations Auditor	<ul style="list-style-type: none"> Assess harvest planning and implementation Review compliance program planning and implementation Assist in assessment of achievement of management objectives and forest sustainability 	33 years of forestry experience including 30 years with the MNR and three years as an independent forest consultant; professional skills in wood measurement and forest compliance.
Mr. John McNicol	Wildlife/Ecology Auditor	<ul style="list-style-type: none"> Review and inspect AOC documentation and practices Review and inspect aspects of forest management related to environmental practices, values and wildlife protection Review access planning and implementation Assist in assessment of achievement of management objectives and forest sustainability 	M.Sc. Zoology; 33 years forestry experience; co-authored many of the guidelines currently used in forest management planning; auditor or technical advisor on eight Independent Forest Audits.
Ms. Susan Jarvis	Modelling (SFMM) Auditor	<ul style="list-style-type: none"> Review the long-term strategic planning in the SFMM cases for the 2000-2005 FMP Assist in assessment of achievement of management objectives and forest sustainability 	R.P.F.; 23 years of forestry experience in Ontario; auditor on two Independent Forest Audits in 2000 as the Forest Management Planning Specialist, and 13 Independent Forest Audits in 2001 to 2006 as Forest Management Planning Technical Expert.

Appendix C

Independent Forest Audit Guiding Principles

Independent Forest Audit Guiding Principles

Guiding Principles within the Independent Forest Audit Process and Protocol

1. Commitment

Commitment is reflected in vision, mission and policy statements of the company. Vision and mission statements are intended to provide long-term guidance for the organization. Policy statements reflect how the organization's vision and mission will be achieved. These statements must be reflected in the day-to-day operations of the organization.

2. Public Participation

The process of sustainable forest planning, implementation and monitoring is conducted in an open consultative fashion, with input from all members of the planning team, Local Citizens Committee, native groups, and other parties with an interest in the operations of the forest unit.

3. Forest Management Planning

The forest management planning process involves the input of a number of individuals and groups to describe the current condition of the forest, the values and benefits to be obtained from the forest, the desired condition of the forest in the future, and the best methods to achieve that goal. Certain minimum standards and procedures have been established upon which all management units are evaluated.

4. Plan Implementation

Verification of the actual results of operations in the field compared to the planned operations is required to be able to assess achievement of the plan objectives and compliance with laws and regulations. In conjunction with the review of operations, the reporting tables are tested to ensure accurate results are reported.

5. System Support

System support concerns resources and activities needed to support plan implementation so as to achieve the desired objectives. Appropriate control, documentation and reporting procedures must be in place and operational. Planned action should occur at planned times, in planned places and to the planned degree.

6. Monitoring

The activities and the effects of these activities in achieving management objectives must be regularly measured and assessed. In particular, the indicators of achievement must be assessed and their effectiveness reviewed.

7. Achievement of the Management Objectives and Forest Sustainability

Periodic assessments of the management of the forest unit operations and the forest unit must be made in order to determine whether forest sustainability and other management objectives are being achieved. This includes comparing the actual values of the predetermined indicators against the planned values and assessing the reasons for any significant deviations.

8. Contractual Obligations

The licensee must comply with the specific licence requirements.

Appendix D

List of Acronyms

List of Acronyms

ACOP	Annual Compliance Operation Plan	RTA	Forest Renewal Trust Account
AHA	Available Harvest Area	SEIM	Socio-Economic Impact Model
AOC	Areas of Concern	SEV	Statement of Environmental Values
AR	Annual Report	SFL	Sustainable Forest Licence
AWS	Annual Work Schedules	SFMM	Strategic Forest Management Model
B&S	Barren and scattered	SGR	Silviculture Ground Rule
CFSA	Crown Forest Sustainability Act	SMA	Selected Management Alternative
CLAAG	Careful Logging Around Advanced Growth	STP	Silvicultural Treatment Package
CMU	Crown Management Unit	T&C	Term and Condition
EA	Environmental Assessment	TAR	Trend Analysis Report
EBR	Environmental Bill of Rights	TMP	Timber Management Plan
FEC	Forest Ecosystem Classification	VFM	Vermilion Forest Management Company Ltd.
FFC	Forestry Futures Committee		
FIM	Forest Information Manual		
FMA	Forest Management Agreement		
FMNCP	Forest Management Native Consultation Process		
FMP	Forest Management Plan		
FMPM	Forest Management Planning Manual		
FOIP	Forest Operations Information Program		
FOIR	Forest Operations Inspection Report		
FOP	Forest Operation Prescription		
FRI	Forest Resource Inventory		
FRP	Forest Resource Partnership		
FSC	Forest Stewardship Council		
FTG	Free-to-Grow		
FU	Forest Unit		
GIS	Geographic Information System		
GLSL	Great Lakes St. Lawrence		
HPA	High Priority Aspect		
IFA	Independent Forest Audit		
IFAPP	Independent Forest Audit Process and Protocol		
KBM	KBM Forestry Consultants Inc		
LCC	Local Citizens Committee		
MADCALC	Maximum Allowable Depletion Calculator		
MAFA	Moose Aquatic Feeding Area		
MNR	Ministry of Natural Resources		
NDPEG	Natural Disturbance Pattern Emulation Guideline		
NRVIS	Natural Resource Values Information System		
NSR	Not Satisfactorily Regenerated		
OMNR	Ontario Ministry of Natural Resources		
ONAS	Ontario Native Affairs Secretariat		
OLL	Ontario's Living Legacy Land Use Strategy		
R.P.F.	Registered Professional Forester		
RPFO	Report of Past Forest Operations		
RSA	Resource Stewardship Agreement		

Appendix E

Summary of Input to the Audit Process

Summary of Input to the Audit Process

General Public/Other Stakeholders

An advertisement was placed in the *Sudbury Star*, *North Bay Nugget* and *Wawatay* newspapers providing notice of the audit and offering the public an opportunity for input to the audit process. The notice directed the public to contact the Sudbury LCC Chairman or the audit secretariat with any comments regarding forest management activities on the Sudbury Forest.

Public Survey

KBM prepared a one-page public survey that was distributed to all organizations and to a random sample of one-third of the individuals listed in the FMP mailing list. In total, 812 surveys were sent out. In addition, the public notice was posted on and available for download from KBM's web site (www.kbm.on.ca). The purpose of the survey was to solicit public input and to provide respondents with an opportunity to identify and discuss any site-specific concerns on the Forest. Twenty-one responses were received and are summarized in Table below.

Table 15. Responses to Public Survey.

Respondent	Comment or Concern	Response
1	• concerned about possible tree piracy and questioned cut inspections and sustainability clauses within licenses.	Considered by audit team
2	• no concerns	Considered by audit team
3	• concerned about the amount of Boreal forest being harvested and loss of wilderness area.	Considered by audit team for the Sudbury Forest specifically.
4	• concerned about the effectiveness of the MNR consultation process.	Considered by audit team
5	• outfitter concerned with monitoring of access restrictions	Included example site and interviewed stakeholder at the site.
6	• Land-use permit holder concerned about potential logging on and adjacent to the permit area and worried about the possible sale of the land to private timber companies.	Audit team spoke with individual and followed up with MNR.
7	• pleased with management of the Sudbury Forest (18 Mile Island area).	Considered by audit team
8	• concerned with logging too close to Hwy 637	Included example field stop.
9	• concerned with insufficient buffer along Hwy 637 and effectiveness on MNR monitoring	Included example field stop.
10	• pleased with management of the Sudbury Forest (Kukagami area)	Considered by audit team
11	• Government agency with concerns over minimal public notification of harvest activity in highway buffer zone and lack of planning and training regarding the creation and use of forest access points on highways.	Considered by audit team
12	• Cottagers group with concerns over access restrictions for non-aboriginals	Considered by audit team
13	• Archaeological group with recommendation for the use of a licensed archaeologist for the assessment of all areas prior to alteration and the use of Cultural Heritage Guidelines in forest management planning	Considered by audit team
14	• Cottagers group concerned with forest management planning process and a lack of resolution for a specific issue	Audit team interviewed all parties including the representative of group
15	• Concerned with possible consequences of cutting near water bodies, the use of monoculture plantations and the lack of opportunity to review FMP at a convenient location (Toronto).	Considered by audit team

Respondent	Comment or Concern	Response
16	<ul style="list-style-type: none"> Concerned with perceived lack of planting in cutover areas. 	Auditors reviewed silviculture program and its effectiveness
17	<ul style="list-style-type: none"> Hunter with no concerns 	Considered by audit team
18	<ul style="list-style-type: none"> Tourist operator with concerns over blowdown in harvest area and the application of selective harvest on inappropriate sites in Trout Lake area (Harvest 89 - Trout Lake south shore and 90 - Trout Lake north shore). 	Considered by audit team
19	<ul style="list-style-type: none"> Concerned with logging damage to recreational trail and severe rutting in Hunter Lake area on Kilarney Hwy. 	Site was included in field stops.
20	<ul style="list-style-type: none"> Concerned with ensuring that the Sudbury FMP has been amended to consider section 68 (5) of the Crown Forest Sustainability Act and the MNR documents: "Our Sustainable Future" and "Ontario's Biodiversity Strategy" 	Considered by audit team
21	<ul style="list-style-type: none"> Individual interested/concerned over the implementation and effectiveness of access restrictions. 	Included example site and reviewed documentation.

First Nations

The one-page public survey described in the previous section was sent to the following First Nations and native groups:

- Chiefs of Ontario
- Dokis First Nation
- Henvey Inlet First Nation
- Mattagami First Nation
- Metis Nation of Ontario
- N'swakamok Native Friendship Centre
- Ontario Metis and Aboriginal Association
- Temagami First Nation
- Teme-Augama Anishnabai
- Wahnapiatae First Nation
- Whitefish Lake First Nation
- Whitefish River First Nation
- Wikwemikong Unceded First Nation
- Woodland Metis Tribal Area #4

Additionally, the audit team sent individual letters of participation to the following First Nations:

- Dokis First Nation
- Henvey Inlet First Nation
- Mattagami First Nation
- Temagami First Nation
- Teme-Augama Anishnabai
- Wahnapiatae First Nation
- Whitefish Lake First Nation
- Whitefish River First Nation
- Wikwemikong Unceded First Nation

One meeting was held with representatives of Whitefish Lake First Nation.

Local Citizens Committee

During the site visit, the audit team met with the Sudbury LCC, and members of the LCC participated on field site visits. An LCC member participated in the opening meeting, the field site visits and closing meeting and the LCC participated in a separate meeting with the audit team on August 22. This meeting provided an opportunity for members to express their concerns and suggestions for improvement and provided input for the audit team's consideration. Overall, LCC members felt the LCC was effective and that members were able to make a significant contribution to the forest management planning process.

Overlapping Licensees, Contractors and Commitment Holders

The one-page public survey described in the previous section was sent to all shareholders who are also licence holders. These companies are as follows:

- H & R Chartrand Lumber Co. Ltd.
- Domtar Inc.
- Gervais Forest Products Ltd.
- Lahaie Lumber Ltd.
- N'Swakamok Forestry Corporation
- Grant Forest Products Inc.

Each of the contractors on the FMP mailing list were also sent the one-page public surveys. Representatives of several of the aforementioned companies met with auditors on the field visit component of the audit.

SFL Holder

VFM staff provided the majority of the input into the audit. Methods of input included: providing background documentation such as the forest management plan, the Trend Analysis Report, maps, meeting minutes, and guiding of field inspections. The audit team recognizes and appreciates that the staff made great efforts to assemble the field binders and organize many aspects of the audit. Numerous interviews were supported with extensive discussion in the field with VFM staff. These discussions formed a significant basis for understanding forest management on the Sudbury Forest.

Ministry of Natural Resources

MNR staff provided significant input into the audit through interviews and preparation of documentation. Representatives from the Sudbury office were present at the pre-audit meeting, and opening and closing meetings, as well as the field site visit.

Appendix F
Public Survey

**KBM FORESTRY CONSULTANTS INC.
2006 INDEPENDENT FOREST AUDIT
PUBLIC SURVEY**



Every five years, as part of the Province's responsibility for resource management in Ontario, the Ministry of Natural Resources (MNR) contracts firms to evaluate forest management activities on Crown lands. KBM Forestry Consultants Inc. of Thunder Bay, Ontario has been engaged by the MNR this year to conduct an independent forest audit of the Sudbury Forest for the period 2001-2006.

As part of our evaluation, we would appreciate your input as a member of the public with an interest in forest management on the Sudbury Forest. If you have comments related to forestry activities during the five-year period April 1, 2001 to March 31, 2006, please complete and submit this form (please see back of sheet for more information on the audit process).

KBM provides this opportunity to comment on the Sudbury Forest audit, under the authority of Ontario Regulation 160/04 made under the Crown Forest Sustainability Act, 1994. Any personal information provided will be used solely by the audit team as input to the Sudbury Forest Independent Forest Audit. Any questions regarding the collection, use, and retention of the personal information can be directed to Peter Higgelke, Lead Auditor at 807-345-5445 ext. 231 (email: higgelke@kbm.on.ca) or to the company address indicated below.

Name:
(optional)

Tel. and/or email:
(optional)

1. What is your interest in forest management on the Sudbury Forest?

Recreation ☐

Employment (forestry, tourism, etc.) ☐

Conservation ☐

Other: _____

2. Can you identify any specific locations or activities on the Sudbury Forest that illustrate good OR poor management practices, and that the audit team should be aware of in conducting their evaluation? Please provide details.

3. Have you ever contacted forest managers with comments or concerns during the 2001-2006 audit period? (e.g. local Ministry of Natural Resources, Vermillion Forest Management Company.) ☐ Yes ☐ No

4. If yes, were you satisfied with the response? ☐ Yes ☐ No

5. Feel free to add any additional comments (use additional sheet if required).

6. Please indicate if we may contact you for more information. ☐ Yes ☐ No
(If Yes ensure that you have provided your contact information above.)

Please **mail, email, or fax** the completed survey (Attention: Dave Thomson) to the address/fax number below by Monday **August 14, 2006**.

The survey can also be accessed through our website, located at www.kbm.on.ca

Although we cannot respond to everyone, we do take into consideration all comments received.

THANK YOU IN ADVANCE FOR YOUR INPUT.

KBM Forestry Consultants Inc.
dthomson@kbm.on.ca

349 Mooney Avenue
Thunder Bay, ON P7B 5L5
<http://www.kbm.on.ca>

Tel: (807) 345-5445 ext. 259
Fax: (807) 345-5858

INDEPENDENT FOREST AUDIT Sudbury Forest

KBM Forestry Consultants Inc. has been retained by the Ministry of Natural Resources (MNR) to conduct an Independent Forest Audit, consistent with the Crown Forestry Sustainability Act, on the management of the Sudbury Forest.

The audit covers the April 1, 2001 to March 31, 2006 operating period. You are invited to comment on the forest management activities on the Sudbury Forest for this period of time. Please mail, email, or fax this form to:

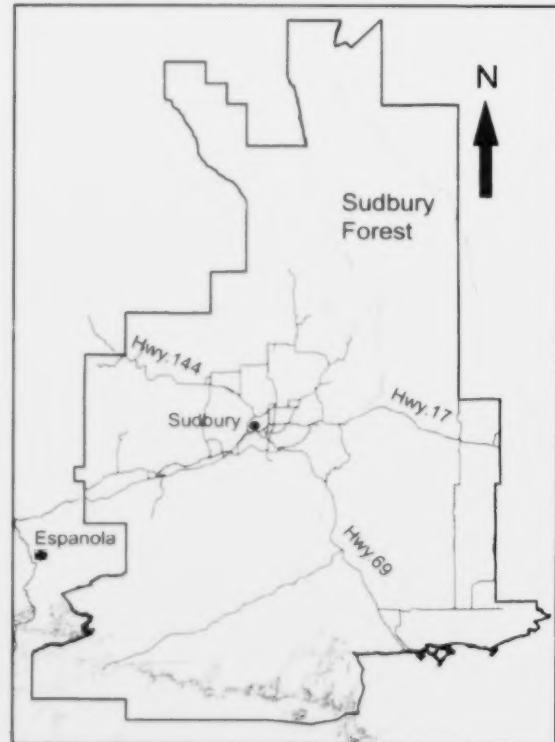
Dave Thomson
KBM Forestry Consultants Inc.
349 Mooney Ave., Thunder Bay, ON P7B 5L5
dthomson@kbm.on.ca
Tel: (807) 345-5445 ext. 259
Fax: (807) 345-5858
Toll-Free: 1-800-465-3001

(All correspondence sent to KBM is confidential).

Alternatively, comments can be made directly to the Local Citizens Committee Chairperson:
Jim Gomm, Chair
Sudbury Forest Local Citizens' Committee
Email: jamesgomm@sympatico.ca

(The privacy of any information given to the LCC may not necessarily be protected).

Comments must be received by Monday
August 14, 2006.



Purpose of the Independent Forest Audit

The Purpose of the audit is to assess:

- compliance with the *Crown Forest Sustainability Act*,
- compliance with the Forest Management Planning Process,
- a comparison of planned versus actual forest management activities,
- the effectiveness of forest management activities in achieving audit criteria and management objectives,
- assess the effectiveness of previous audit action plans, and
- where applicable, a licensee's compliance with the terms and conditions of the Sustainable Forest Licence.

The six-member audit team will evaluate forest management planning and practices such as harvest operations, forest renewal activities, road construction and maintenance as well as opportunities for public input and First Nations consultation. The main objectives of the audit are to assess compliance with provincial laws and regulations as well as comment on the effectiveness and sustainability of forestry activities on the management unit.

In addition, the independent forest audit provides an opportunity to improve Crown land management in Ontario through adaptive management. The audits are conducted by consultants that are independent of the Ministry of Natural Resources and the companies being audited, and firms are selected in an arms-length process by the Forestry Futures Committee of Ontario.



Appendix G

Public Notification

Public Notification

SUDBURY FOREST INDEPENDENT FOREST AUDIT

KBM Forestry Consultants Inc. of Thunder Bay, Ontario has been retained by the Ontario Ministry of Natural Resources to conduct an Independent Forest Audit, consistent with the Crown Forest Sustainability Act on the management of the Sudbury Forest. The purpose of the audit is to assess forest management activities within the Sudbury Forest during the five-year audit period from April 1, 2001 to March 31, 2006. Specifically:

- compliance with the Crown Forest Sustainability Act;
- compliance with the Forest Management Planning process;
- a comparison of planned versus actual forest management activities;
- the effectiveness of forest management activities;
- the effectiveness of previous audit action plans; &
- compliance with the terms and conditions of the Sustainable Forest Licence.

You are invited to comment on forest operations on the Sudbury Forest for this period of time. Please provide your comments by Monday, **AUGUST 14, 2006** directly to the Local Citizens Committee:

Sudbury Forest LCC Chair

Jim Gomm

Email: jamesgomm@sympatico.ca

The privacy of information given to the LCC may not necessarily be protected.

Alternatively, comments can be sent directly to:

Dave Thomson

KBM Forestry Consultants Inc.

349 Mooney Avenue

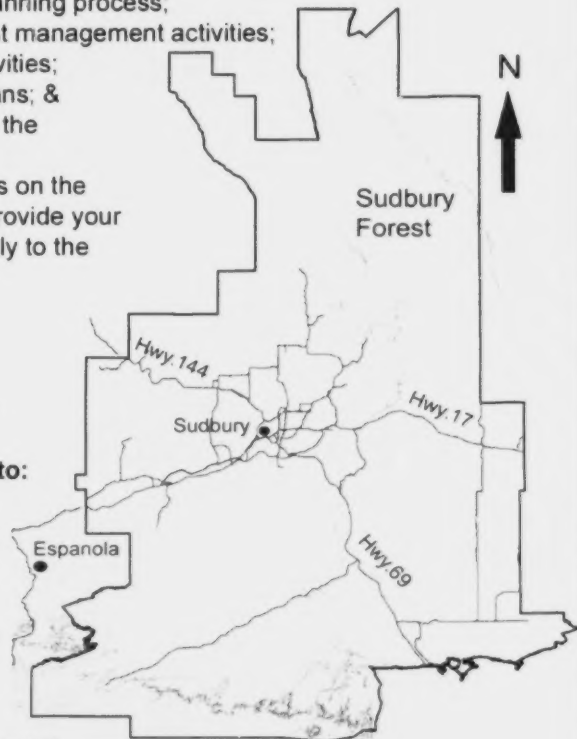
Thunder Bay, ON P7B 5L5

Tel: 807-345-5445 ext. 259

Fax: 807-345-5858

Toll Free: 1-800-465-3001

Email: dthomson@kbn.on.ca



All correspondence sent to KBM is strictly confidential.

For more information or to download and complete our public audit survey please visit:
www.kbm.on.ca

